

REVIEW OF THE GENERA EUPLECTUS, PYCNOPECTUS, LEPTOPLECTUS, AND ACOLONIA (COLEOPTERA: PSELAPHIDAE) INCLUDING NEARCTIC SPECIES NORTH OF MEXICO

JOHN ALEXANDER WAGNER¹

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ABSTRACT: The genera *Euplectus*, *Pycnopectus*, *Leptoplectus*, and *Acolonia* are reviewed for Nearctic species North of Mexico. These four genera are closely related pselaphid beetles in the subtribe Euplectina. Ten *Euplectus* species are recognized including two unreported European species in Eastern North America. Eleven *Pycnopectus* species are recognized, including three new species. *Leptoplectus* and *Acolonia* each have one species. Several new combinations and synonymies are established. Descriptions and keys of genera, species groups, and species are included, with figures of some of the significant features of these taxa. A discussion of ecology, and some notes on behavior and distribution complete the report.

INTRODUCTION

The family Pselaphidae was described by Latreille in 1807. In 1816 H. T. Reichenbach in his *Monographia Pselaphorum* described three European species, *nanus*, *karsteni*, and *signatus* in the genus

¹ Department of Biology, Kendall College, Evanston, Illinois 60204. Research Associate, Department of Biological Sciences, Northwestern University.

Pselaphus. W. E. Leach erected the genus *Euplectus* in 1817 with *Euplectus nanus* (Reichenbach) becoming the type species for the genus. Due to the early recognition of this genus a great number of species, mostly European, were named during the latter 1800's. Many of these species, although euplectine in form, were not true *Euplectus*, and the task of unscrambling this heterogeneous group was assumed by the brilliant coleopterist, Achille Raffray. In 1910 he revised the Palearctic *Euplectus* in what constituted the first regional treatment of the genus. Raffray emphasized the taxonomic importance of the secondary features of the male venter, but warned against the use of slight differences in establishing subspecies, varieties, and races.

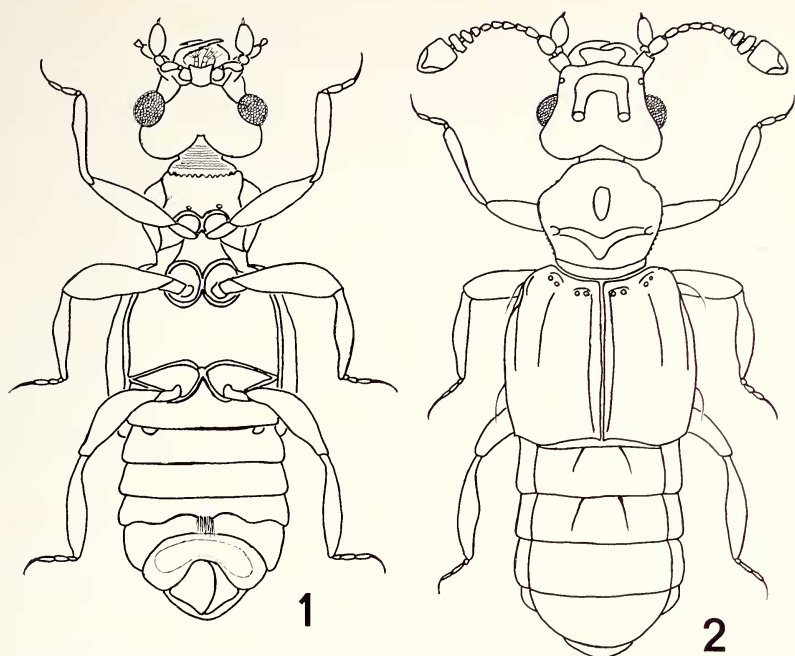
René Jeannel has made the most significant contributions to knowledge of the Afro-Eurasian pselaphid taxonomy since Raffray, and currently Claude Besuchet and Zora Karaman have each contributed to the modern systematics of the *Euplectus* populations of these regions.

The first North American *Euplectus*, described by John L. LeConte in 1850, were from the Eastern United States. In the following years a number of additional species were described by Thomas L. Casey, Emil Brendel, Raffray, and John R. Bowman. In 1893 Casey divided the North American *Euplectus* into three subgeneric groups, two of which, *Pycnoplectus* (Casey, 1897) and *Leptoplectus* (Casey, 1908) he later named and elevated to generic rank. The third group remained as *Euplectus*, *sensu strictiore*, and appears more closely allied with Palearctic *Euplectus* (*s. st.*) and *Euplectus* (*Diplectellus*) Reitter. Also in 1893 Casey established the genus *Acolonia* for a species which LeConte had earlier placed in *Euplectus*. Subsequent authors accepted these divisions except for the genus *Pycnoplectus*. Park (1942, p. 26) considered it to be of subgeneric status, but I now consider *Pycnoplectus* to be of valid generic rank.

Four distinct genera can be defined based on the characteristics presented in the key and on the general appearance. In particular, the loss of anterior prosternal foveae in *Pycnoplectus*, and the dextral arcuation of the seventh sternite are fundamental changes from *Euplectus* and must involve internal muscular rearrangements. The form of the aedeagi, and modifications of the male venter seem to confirm these genera as natural groups.

The eminent American authority, Orlando Park, studied *Euplectus* in the 1950's, and when I became his student he suggested that I work on the genus. I was able to examine all of the type specimens of Nearctic *Euplectus* and its derived genera, and this study is based on those examinations as well as extensive field collections.

It is curious to note that two of the original *Euplectus* species,



FIGS. 1-2. *Euplectus confluens* LeConte. 1. Ventral. 2. Dorsal.

karsteni and *signatus* of Europe, are found in Eastern North America. Our information on the Holarctic relationships of the genus is quite incomplete, but this report establishes the solid generic characters of the Nearctic *Euplectus* and its associated genera, and suggests that zoogeographic studies of this cosmopolitan group might prove to be most rewarding.

CHECKLIST

Euplectus Leach, 1817, p. 80

confluens group

Euplectus confluens LeConte, 1850, p. 105.

Euplectus longicollis Casey, 1884, p. 99.

Euplectus karsteni (Reichenbach), 1816, p. 71.

Euplectus iowensis Casey, 1893, p. 456. **New synonym.**

Euplectus filiformis (Casey), 1908, p. 268. **New combination.**

californicus group

Euplectus californicus Casey, 1887, p. 476.

Euplectus acomanus Casey, 1908, p. 265.

Euplectus idahoensis Park and Wagner, 1961, p. 17.

Euplectus elongatus Brendel, 1893, p. 281.

Euplectus duryi Casey, 1908, p. 266.

Euplectus barri Park and Wagner, 1961, p. 17. **New synonym.**

Euplectus (Diplectellus) signatus (Reichenbach), 1816, p. 73.

Pycnoplectus Casey, 1897, p. 552

linearis group

Pycnoplectus linearis (LeConte), 1850, p. 104. **New combination.** Type species.

Euplectus impressiceps Casey, 1908, p. 265. **New synonym.**

Pycnoplectus interruptus (LeConte), 1850, p. 105. **New combination.**

Euplectus hudsonicus Casey, 1893, p. 455. **New synonym.**

Pycnoplectus cediosus, new species.

Pycnoplectus parki, new species.

sexualis group

Pycnoplectus sexualis (Casey), 1884, p. 103. **New combination.**

Pycnoplectus spinifer (Casey), 1884, p. 104. **New combination.**

Pycnoplectus infossus (Raffray), 1903, p. 541. **New combination.**

Euplectus excavatus Bowman, 1934, p. 141. **New synonym.**

congener group

Pycnoplectus congener (Casey), 1884, p. 101. **New combination.**

Pycnoplectus tenellus Casey, 1897, p. 552. **New synonym.**

Pycnoplectus longipennis (Casey), 1908, p. 264. **New combination.**

Pycnoplectus difficilis (LeConte), 1850, p. 106. **New combination.**

Euplectus longissimus Brendel, 1890, p. 71. **New synonym.**

Pycnoplectus falcatus, new species.

Leptoplectus Casey, 1908, p. 266

Leptoplectus pertenuis (Casey), 1884, p. 109.

Leptoplectus insolens Casey, 1908, p. 268. **New synonym.**

Leptoplectus exilissimus Casey, 1908, p. 269. **New synonym.**

Acolonia Casey, 1893, p. 443, 454

Acolonia cavicollis (LeConte), 1878, p. 387.

SPECIES OF DOUBTFUL POSITION OR VALIDITY

At present the females of the *Euplectus* Complex are identified to species only by association with male specimens. Further study may disclose characters that will permit a valid female taxonomy as Grigarick and Schuster (1971) have done for *Actium* and *Actiastes*. The following three species were described from single female specimens. I have examined the types, and as is usual for females, I have found no distinguishing characters. Casey's descriptions are of a generic nature, therefore, *Euplectus disjunctus* Casey, 1897, p. 554 (USNM Type no. 38621); *Euplectus floridae* Casey, 1908, p. 264 (USNM Type no. 38620); and *Euplectus imperfectus* Casey, 1897, p. 553 (USNM Type no. 38612) should each be considered a *nomen dubium*.

Euplectus schmitti was described by Raffray from a specimen or specimens sent to him by Jerome Schmitt of St. Vincent College. The locality given by Raffray is Pennsylvania, probably St. Vincent or nearby Chestnut Ridge, both in Westmoreland County. I examined the type of *E. schmitti*, from the Paris Museum and found it to be a female! Raffray's description is of a male with the following diagnostic characters: The sixth ventral segment has a slight impression, and the seventh is transverse and obliquely carinate. This description places *schmitti* near *E. duryi* Casey. Until the male type is located or more specific information is available, *Euplectus schmitti*, Raffray, 1903, p. 540 should be considered a *nomen dubium*.

Two other species, *Euplectus planipennis* Brendel, 1889, p. 195 and *Euplectus rotundicollis* Brendel, 1890, p. 61 are not *Euplectus*. The types are males each with seven sternites, the seventh a simple, undivided plate, as in *Ramecia*, but their true generic status has not been established.

KEY TO THE GENERA OF THE EUPLECTUS COMPLEX OF THE NEARCTIC REGION

1. Head with supraocular and short infraocular sulcus; known only from Florida, very rare *Acolonia* Casey
Head not provided with such sulci 2
2. Form slender and small; head flattened with shallow, glabrous frontal depression (fig. 14); labrum truncate, deeply divided by U-shaped notch (fig. 14); last antennal segment with single, large, anteapical sensory fossa (fig. 11) *Leptoplectus* Casey
Form relatively larger; frontal depression and labrum not as

- described; last antennal segment with two large, antepical sensory fossae (fig. 12) 3
3. Vertexal foveae small and nude; anterior prosternal foveae present (fig. 9, APF)²; mandibles with only aciculate setae on external face (fig. 8); males with carina of seventh sternite arcuate to the morphological left; aedeagus without accessory phallus (fig. 16, AP) *Euplectus* Leach
- Vertexal foveae large and pubescent (only evident in dry specimens); anterior prosternal foveae obsolete²; mandibles with spinoid seta on external face (figs. 6 and 7); males with carina of seventh sternite arcuate to morphological right; aedeagus with accessory phallus (fig. 16, AP) *Pycnoptectus* Casey

Genus *Euplectus* Leach

Euplectus Leach, 1817, p. 80. Type species, *Euplectus nanus* (Reichenbach), 1816, p. 69 (original genus, *Pselaphus*). Aube, 1833, p. 51 (descript.). Subsequent references to Nearctic species: LeConte, 1850, p. 105 (descript.). Henshaw, 1885, p. 30 (cat. citation). Brendel & Wickham, 1890, p. 53 (key to spp.; descript. note; distr. data). Casey, 1893, p. 454 (key to subgeneric groups). Raffray, 1903-04, p. 84 (cat. citation); 1908, p. 84 (descript.; key to subgenera; cat. world spp.); 1911, p. 29 (cat. world spp.). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 25 (key to spp.; descript.; summary of fauna to date). Park, 1942, p. 99 (descript. notes; distr. data); 1952, p. 89 (key to spp.; distr. data), p. 144 (figs.); 1953c, (key to U.S. genera; checklist). Park & Wagner, 1961, p. 16 (descript.; distr. data; figs.). Arnett, 1961, p. 321 (cat. citation).

DISCUSSION: This genus includes ten species in Canada and the United States which I consider valid. The four Mexican Nearctic species in *Euplectus* are represented by only 22 specimens in the Park collection (OP-FMNH). Park (1952, p. 91) suggested that *parvo- culatus* and *patocolus* could well be placed in a new subgenus. I agree and would add *guatemalensis* and *mexicanus* to this group. Considering the small sample sizes of these species it seems best to wait until some of the recent Mexican and Central American collections are studied before redefining these interesting populations.

Euplectus is quickly characterized by 1) small nude vertexal foveae, 2) the absence of cephalic sulci adjacent to the eyes, 3) the presence of anterior prosternal foveae, 4) males with the carina of seventh sternite arcuate to the left, and 5) the aedeagus lacking the accessory phallus.

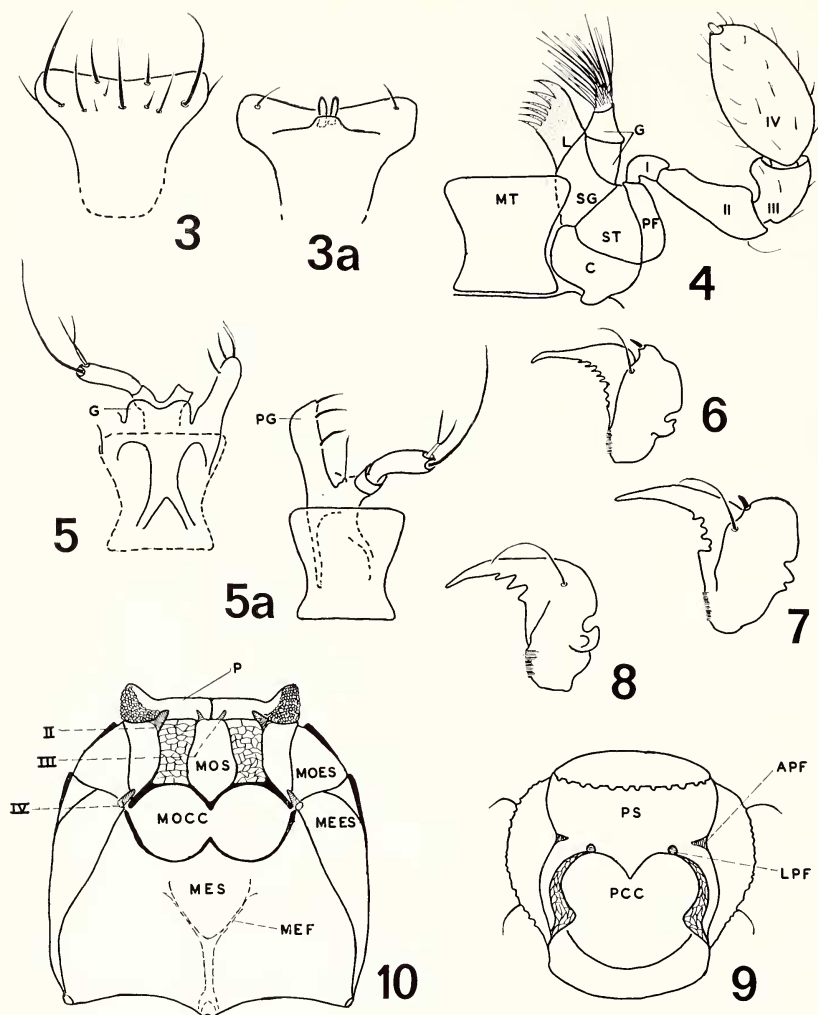
² The full form of the anterior prosternal foveae is best seen on slide preparations at 400 ×; by comparing them with the lateral prosternal foveae (present in both *Euplectus* and *Pycnoptectus*) their presence or absence is obvious.

DESCRIPTION: Body form elongate, more or less parallel-sided and flattened. Average length, including head, thorax, and abdomen of dry, point-mounted specimens about 1.3 mm. Color uniform light brown in teneral, darkening in older individuals, quite red-brown in some. Integument punctulate with sparse, long, golden, aciculate setae.

Head: Widest through eyes, tempora well rounded; front depressed with sulciform impression; vertex flat or convex with two nude foveae connected to frontal impression by sulci, often forming U-shaped impression with frontal sulcus; small fovea behind each antennal tubercle. Eyes salient, near middle of lateral side of head, with about forty medium sized facets. Ventral surface with aciculate subappressed, sparse setae, usually pointed anteriorly; smooth to coarsely punctate. Antennae 11 segmented, not geniculate, slightly shorter than combined head-pronotum length; segment 1 cylindrical, slightly larger than globular second, 3–7 smaller moniliform, 8 slightly transverse; club of last three segments, 9–10, progressively larger and transverse, 11 largest, conical, apex divided into two sensory depressions which contain beta sensilla (fig. 12). Park (1950, p. 53) figures the placement of the sensilla in *E. confluens*. Labrum bearing setae, variable in shape, outer margin barely concave in *E. confluens*; ventral surface with small median tubercle from which two sensory cones project to just beyond distal margin (fig. 3a). Their position indicates tasting function. Mandibles pointed, from three to eight teeth on internal ramus, and fine molar development; middorsal face with single long seta, but never with spinoid seta (fig. 8). Maxilla as figured (fig. 4) with little interspecific variation; palpi 4 segmented, terminal sensory cone figured by Park (1950, p. 53). Labium (fig. 5) with glossae reduced to two central setae on membranous lobes and flanked by membranous paraglossae; palpus with two strong setae, inner seta bifurcate.

Thorax: Prothorax cordiform, convex disc always with midlongitudinal sulcus and midantebasal foveoid depression which may join subpubescent, lateral antebasal foveae by well defined to obsolete transverse sulcus. Prosternum not carinate, lateral prosternal foveae (LPF) and anterior prosternal foveae well defined, LPF pubescent. Procoxal cavities confluent; surface posterolateral to cavities reticulate (fig. 9).

Mesosternal and metasternal fields (as shown in fig. 10); mesocoxal cavities confluent; metacoxal cavities contiguous; preplectoid area laterally imbricate where it articulates with prothorax. Mesosternum divided into three parts by two reticulate areas anterior to coxal cavities; all foveae pubescent: two median mesosternal foveae (MMF or III), lateral mesosternal foveae (II), and lateral mesocoxal



FIGS. 3-10. Figs. 3-5. *Euplectus confluens* LeConte. 3. Labrum. 3a. Ventral view. 4. Maxilla, ventral view. MT—mentum, C—cardo, ST—stapes, PF—palpifer, I-IV—palpus, SG—subgala, G—galea, L—lacinia. 5. Labium, dorsal view. G—glossa. 5a. Labium, ventral view. PG—paraglossa. Fig. 6. *Pycnoptectus sexualis* (Casey), right mandible, dorsal. Fig. 7. *Pycnoptectus linearis* (LeConte), right mandible, dorsal. Figs. 8-10. *Euplectus confluens* LeConte. 8. Right mandible, dorsal. 9. Prothorax, ventral. PS—prosternum, PCC—procoxal cavities, APF—anterior prosternal foveae, LPF—lateral prosternal foveae.

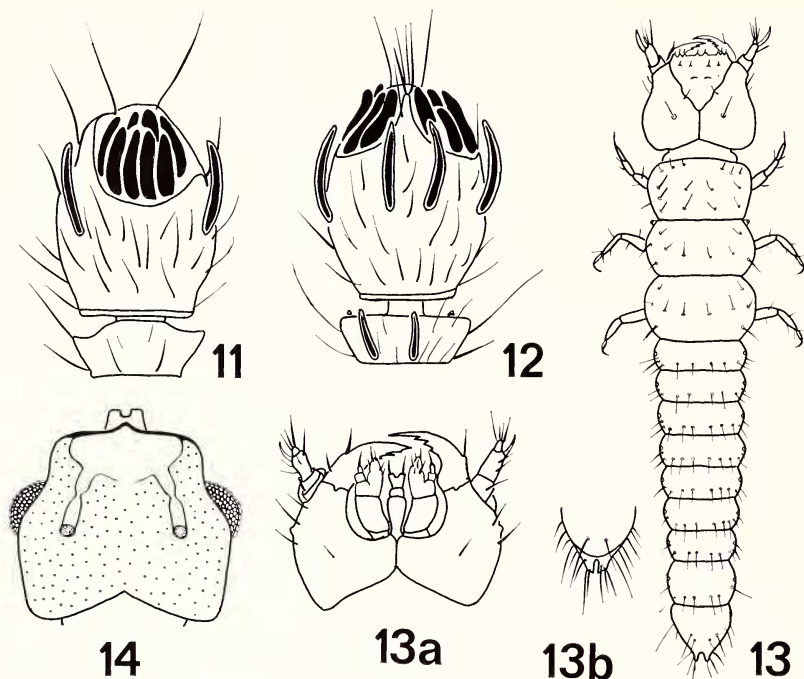
foveae (IV); longitudinal impression of metasternum supports metasternal furca (dotted lines fig. 10). Elytron with pubescent sub-humeral fovea and associated plicoid entire stria; disc with four ante-basal foveae (slide examination at $430\times$ may be necessary to discriminate them), sutural fovea with entire stria, juxtahumeral and humeral foveae may be united and associated with stria which stops midway in elytral length. Metawings membranous, lacking veins except in proximal third (fig. 18), surface microsetate, posterior margin bears long alar setae, wing length comparable to total body length, 1.2 mm in *E. confluens*.

Legs: Not modified in *Euplectus*, procoxae and mesocoxae globular, metacoxae triangular, extending to lateral margin; mesotrochanters relatively short, articulated with femur in brachysceline form; femora (especially mesofemora) relatively swollen in males; tibiae fusiform or distally expanded, mesotibia with minute mesial laminoid lobe or spine at apex; tarsi 3 segmented, segment 1 short, 2-3 relatively very long, 3 bearing single claw.

Abdomen: Dorsum with five visible segments, actually six present, but first actual tergite or hypotergite covered by elytra; lateral margins strong, first three tergites subequal, fourth largest; fifth more rounded—obtuse; first two tergites bear two divergent basal carinae, area between carinae basally depressed and densely pubescent, small fovea at base of each carina. Lateroanterior angle of hypotergite and first sternite of both sexes bears stridulatory organs as reported by Park (1963, p. 183) for *Actiastes wagneri*. Left tergal area of female *E. confluens* (fig. 15) differs from *A. wagneri* in possessing many small spines arranged in long rows on margin, and in transverse groups mesially; elytra provided with small terminal striae on inner surfaces, thus stridulations are produced by movement of elytra over sternal and tergal imbrications. Six sternites in females, all simple and undivided, first five subequal, sixth triangular. Males with seven visible sternites, seventh relatively large, and always divided asymmetrically into right and left terminal plates. At copulation these two plates move ventrolaterally to allow extension of aedeagus; dividing carina arcuate to morphological left; fourth, fifth, and sixth sternites in males

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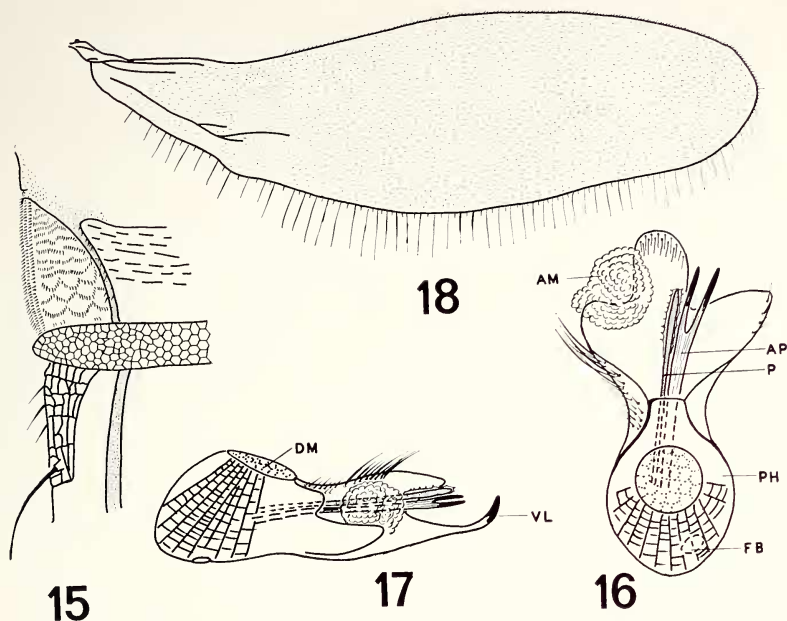
10. Mesothorax and metathorax, ventral. P—proplectoid area, MOS—mesosternum, MOES—mesoepisternum, MOCC—mesocoxal cavities, MES—metasternum, MEES—metaepisternum, MEF—metasternal furca, II—lateral mesosternal fovea, III—median mesosternal fovea, IV—lateral mesocoxal foveae.



FIGS. 11-14. Figs. 11 & 14. *Leptoplectus pertenuis* (Casey). 11. Tenth and eleventh antennal segments showing placement of alpha sensilla within anteapical fossa and beta sensilla on surface. 14. Head, dorsal view. Figs. 12 & 13. *Euplectus confluens* LeConte. 12. Tenth and eleventh antennal segments showing placement of alpha and beta sensilla in double fossae. 13. Larva, modified from Böving and Craighead (1931), dorsal. 13a. Ventral view of head. 13b. Ventral view of terminal abdominal segment.

variously modified by fossae, laminoid projections, setal tufts, and membranous lobes.

Aedeagus: Basal capsule (figs. 16-17) or phallobase bulb, elongate with dorsal membrane-covered area and ventral *foramen basalis* with sperm duct; dorsal membrane held by numerous muscle bands which insert on base of capsule, and which at contraction, depress membrane and exert intromittent organs by hydrostatic pressure. Distal armature with ventral lobe, lateral lobes, anteapical membrane, phallus, but lacking accessory phallus. Ventral lobe extends farthest apically, truncate or spatulate with numerous terminal canaliculi that end distally in micropores. Lateral lobes variable, either



FIGS. 15–18. Figs. 15 & 18. *Euplectus confluens* LeConte. 15. Presumed stridulatory apparatus on first actual tergite (hypotergite) and first visible tergite, left dorsal aspect. 18. Metawing of female, 1.2 mm long. Figs. 16 & 17. Hypothetical pycnoplectoid aedeagus. 16. Dorsal. AM—anteapical membrane, P—phallus, AP—accessory phallus, PH—phallobase (basal capsule), FB—basal opening. 17. Lateral. DM—dorsal membranous foramen, VL—ventral lobe.

may be reduced so that entire aedeagus appears asymmetrically skewed to right or left, one or both lobes bear setae. Anteapical membrane often conceals details of phallus sometimes positioned beneath it; bearing spines, tubercles, granules or smooth. Phallus often bifurcate or otherwise modified.

DISCUSSION OF DEVELOPMENT: Very little is known of pre-imagine pselaphids; adults have been collected *in copulo*, and mating behavior described in *Adranes taylori* (Arke and Hill, 1973, p. 532), but females have not been seen laying eggs. The structure of eggs and development is yet unknown. Böving and Craighead (1931, p. 30, pl. 9) show figures of the larvae of two pselaphids, *Batrissodes monstrosus* and *Euplectus confluens*, and Jeannel (1950, p. 23) gives a description of these and points out certain tribal differences. I have found larvae of *E. confluens* associated with adults only occasionally

in alcohol berlesates, but larvae have not been collected alive. One *E. confluens* larva, from a maple tree hole, Illinois, Will County, Monee, Raccoon Grove collected in December 1959 by Walter Suter, was compared with published descriptions. The following description differs from Jeannel's with regard to the number of antennal segments and mandibular teeth. The portions in brackets are taken from Jeannel, since these were obscured in the specimen I examined. Jeannel's description, I believe, was compiled from Böving and Craighead's drawing and not from an actual specimen.

LARVA OF *E. CONFLUENS*: Length 1.23 mm (fixed), form slender elongate; head rounded with narrow cervicum; [epicranial suture straight, connecting to slightly sinuate frontal sutures]; no stemmata, but small tubercle on side of head; clypeus transverse, three tubercles with short setae in each lateral third; labrum with two median sensilla; antenna inserted in circular sockets, apparently 2 segmented, first segment stout-cylindrical, second not as wide but slightly longer bearing an elongate hyaline cone, three-fourths length of segment on distal face, small tubercle on mesial distal face (fourth segment of Jeannel); mandibles short, arcuate, with three acute teeth on internal ramus; maxillae short and broad; cardo large; laciniae in form of broad lobe which bears 5-7 mesoterminal spines; palpi short, triarticulate, inserted on external face of maxillae; [labrum represented by mentum and distinct submentum, mentum inserted on straight submentum. No gula. Palpi two segmented; no distinct ligula]. Thoracic segments subequal; abdominal segments slightly narrower, first seven alike, eighth little longer than seventh; ninth subtriangular, terminating in two small nonsegmented urogomphi; lateral spiracle between first and second thoracic segments, and on each abdominal segment; setae simple; legs slender, tibiae weakly spined, single tarsal claw (fig. 13).

KEY TO THE SPECIES OF *EUPLECTUS* MALES OF UNITED STATES AND CANADA

1. Fourth sternite³ with posteriorly directed, median setal tuft (figs. 23-26) *confluens* group 2
- Fourth sternite lacking median tuft, simple and unmodified, fifth sternite unmodified or with simple depression which merges with depression of sixth sternite (figs. 36-39)
..... *californicus* group 5
2. Apical margin of fourth sternite with median setal tuft flanked

³ Sternite characters are best seen on slide mounts at 100 × to 400 ×; this key is of limited use on point mounted specimens unless they are viewed with superior optics and adequate illumination.

- each side in middle fourth of segment, by rounded, black lamina (figs. 23-24) 3
- Apical margin of fourth sternite with tuft not flanked by black lobes in middle fourth of segment (figs. 25-26) 4
3. Size relatively small; mesotrochanter spined; fourth sternite with black lamina in lateral fourth; aedeagus as illustrated (figs. 21 and 23) *filiformis* (Casey)
- Size relatively larger; mesotrochanter not spined; fourth sternite without black lamina in lateral fourth; aedeagus as illustrated (figs. 22 and 24) *longicollis* Casey
4. Sternites relatively flattened; lateral third of fourth sternite with prominent lamina extending slightly over fifth sternite; fifth sternite with rounded clusters of strongly recurved setae in basal fossae (fig. 25) *karsteni* (Reichenbach)
- Sternites relatively tumid; lateral third of fourth sternite with setiferous swelling, margin without prominent lamina; fossae of fifth sternite with sparse setal clusters (fig. 26) *confluens* LeConte
5. Median impression of sixth sternite small, in medial fourth, containing entirely within impression antepical transverse row of six to 12 papilliform sensilla (fig. 39); left lateral lobe of aedeagus with thumb-like projection, antepical membrane bearing numerous long spikes or spines (figs. 30-31) *duryi* Casey
- Median impression of sixth sternite larger, tubercles or papilliform sensilla not limited to transverse row within impression, but in diagonal row or contiguous cluster at posterior flank; aedeagus not as described, left lateral lobe lacking thumb, antepical membrane not spiniferous 6
6. Papilliform sensilla of sixth sternite in diagonal row at margin of impression (figs. 36-38) 8
- Sensilla at impression margin of sixth sternite in contiguous cluster or replaced by rounded tubercle 7
7. Angle of impression of sixth sternite bearing rounded tubercle, lateral margins of impression evenly carinoid (fig. 35); surface of head coarsely punctate; aedeagus elongate, without long setae (fig. 27) *californicus* Casey
- Angle of impression of sixth sternite with contiguous cluster of sensilla, margins not carinoid (fig. 34); surface of head sparsely to moderately punctate; aedeagus short, ventral lobe broadly expanded, right lobe with a few antepical setae and short spines (fig. 33) *signatus* (Reichenbach)
8. Head with medium punctations ventrally; lateral tumulus of sixth sternite bearing long sensilla and many long setae (fig. 38); left lateral lobe of aedeagus with short sparse setae in tridirectional groups (fig. 32) *elongatus* Brendel

- Head coarsely punctate ventrally; row of sensilla lacking long setae; aedeagus not as described 9
9. Prosternum coarsely punctate, as for gula; median impression of sixth sternite narrowing apically; left lateral lobe of aedeagus with long setae, several extending beyond deeply incised ventral lobe (fig. 28) *acomanus* Casey
- Prosternum less coarsely punctate than gula; median impression of sixth sternite narrowing to base; left lateral lobe of aedeagus with short setae, ventral lobe not deeply incised (fig. 29) *idahoensis* Park & Wagner

CONFLUENS GROUP

Fourth sternite of males with posteriorly directed, median tuft of long setae (figs. 23–26); aedeagus with U-shaped process on antepical membrane (figs. 19–22).

The species in this group present a difficult taxonomic and zoogeographic puzzle which I have not solved. *E. karsteni* has a Holarctic distribution and bears the group name in Europe (Jeannel, 1950, p. 105; Karaman, 1962, p. 161). I prefer *confluens* as a group name to represent the most abundant eastern Nearctic species in this complex, and I feel that *karsteni* is an introduced species. Virtually nothing is known about gene flow within the species of the *confluens* group, although some morphologically distinct demes of *confluens* and *longicollis* are sympatric (in fact, occupy the same beech tree holes), in southern Illinois. The male venter may be more reliable than the aedeagus for species separation, and detailed comparisons with European congeners should be made. The species seem to be found most frequently in tree holes in mature eastern climax deciduous forests.

Euplectus confluens LeConte

Euplectus confluens LeConte, 1850, p. 105. Type locality: Cambridge, Mass., Type female MCZC no. 6189. Subsequent references: Casey, 1884, p. 105. Brendel and Wickham, 1890, p. 69 (distr. rec., Iowa). Blatchley, 1910, p. 332 (descript.). Raffray, 1911, p. 33 (cat. citation). Leng, 1920, p. 128 (cat. citation, distr. data). Bowman, 1934, p. 27 (descript.). Park *et al.*, 1950, p. 39, 52 (ecol., figure, distr. rec., eastern North Amer.). Park and Wagner, 1961, p. 16, 364 (key ref., distr. recs., figures, Juliaetta, Idaho; [Montreal, Canada, not *E. confluens*, but *E. karsteni*]).

DISCUSSION: This has been the most frequently collected species in the eastern deciduous Nearctic. The relatively tumid male venter and lack of prominent projecting laminae of the fourth sternite are diagnostic in most populations. In a few populations the males are

dimorphic; the fourth sternite has a lateral concave glabrous apical margin, which may be darkened and project slightly over the fifth.

MEASUREMENTS OF TYPE FEMALE: Head .246 mm long $\times$.352 mm wide, pronotum .316 mm long $\times$.352 mm wide, elytra .460 mm long $\times$.440 mm wide, abdomen .580 mm long $\times$.440 mm wide, tergite ratio 1-1-1-1.5-1.2, basal abdominal carinae separation .088 mm. Measurements of 10 males of one deme from Dixon Springs, Pope County, Illinois: head mean length .219 $\times$ mean width .291, pronotum mean length .626 $\times$ mean width .281, elytra mean length .386 $\times$ mean width .397, abdomen mean length .432 $\times$ mean width .357, antenna .389 mm long.

Head: Surface flattened, moderately punctate, ambient frontal sulcus shallow, vertexal foveae small, nude; ventral surface moderately punctate; eleventh antennal segment with two apical fossae, each bearing four large beta sensilla, eight smaller, long alpha sensilla in center of segment and ringed around it (Park, 1950, p. IV).

Thorax: Pronotum with small elongate discal impression, ante-basal impression weakly connected with lateral antebasal pubescent foveae; anterior prosternal foveae present, prosternum punctulate; elytron with entire sutural stria, one-half discal stria, antebasal foveae apparently two, but on close examination four are found: humeral, juxtahumeral, sutural, and juxtasutural; subhumeral fovea present; metasternum sparsely punctate.

Legs: Simple, as for genus.

Abdomen: First two tergites with slightly divergent basal carinae, each with basal fovea; female as described for genus, male venter diagnostic: fourth sternite with median tuft of long setae which extends over fifth and recurves at end, in each lateral third a small tumulus with sparse setae and which, in some populations, has slight concave sublaminoid projection (but never as great as that of *karsteni*); fifth sternite medially impressed, each side bearing cluster of anteroventrally directed setae (similar to *karsteni* but setae shorter and not as abundant); sixth with median subreniform impression four-fifths width and row of three to four small sensilla each side of center apical margin (in 30 specimens over total range, average 6.48, range five to eight total sensilla); seventh sternite with carina arcuate to left (fig. 26).

Aedeagus: Left lateral lobe (fig. 19) with from three to 10 setae (in 34 males over total range, average 4.8, modal number 4), but tends to have fewer than *karsteni* or *longicollis*.

MATERIAL EXAMINED: *Massachusetts:* MIDDLESEX CO., Cambridge, 1 female (Type, MCZC). *New Hampshire:* SULLIVAN CO., 25 July 1964, Steeves, 5 males, 17 females, split maple debris (HS).

Washington D.C.: 3 Sept. 1964, Suter, 1 male, forest floor; U.S. National Arboretum, 27 July 1959, Wagner and Suter, 3 males, 1 female, maple TH; Rock Creek Park, 26 Jan. 1967, Suter, 1 male, 4 females, linden TH (JAWC). *Maryland*: CARROL CO., Marriottsville, 26 July 1959, 1 male, ash TH (JAWC); MONTGOMERY CO., Glen Echo, 6 June 1964, Suter, 1 male, beech TH (JAWC). *Delaware*: NEW CASTLE CO., Christiana, 31 May 1953, R. Howard, 1 male (OP). *Pennsylvania*: BLAIR CO., Duncansville, 2 males, 8 females, beech log hole (JAWC); CENTRE CO., Boalsburg, Wildcat Gap, 23 May 1959, F. Fletcher, 6 males, 11 females, oak TH (JAWC), above Bear Meadows, 11 July 1961, 2 males, 8 females, birch TH, 1 male, 2 females, oak TH (JAWC); SULLIVAN CO., Forksville, World's End State Park, 11 July 1959, D. Reichle, Suter, Wagner, 9 males, 45 females, beech TH (JAWC); FULTON CO., Breezewood, 21 Nov. 1961, H. Dybas, 1 male, 2 females, TH; CRAWFORD CO., Tryon's Farm, Coneaut Lake, 12 July 1966, Suter, 1 male, 2 females, beech TH; 1 male, maple TH (JAWC); WESTMORELAND CO., E. of Youngstown, Chestnut Ridge, 3 males, 5 females; 1 male, 3 females; 16 Sept. 1961, Wagner, 14 males, 18 females, beech TH; 11 July 1961, Wagner, 3 males, 10 females, maple TH (JAWC), 16 Sept. 1964, Suter, 1 male, 1 female, beech TH; 11 males, 22 females, stump mold (JAWC); Latrobe, St. Vincent, 28 July 1959, Suter and Wagner, 1 male, 6 females; 8 males, 13 females, beech TH; 1 male, 3 females, maple TH (JAWC), 1 male, 1 female (MCZC), 2 males (OSUC), 1896, 2 males, F. C. Fletcher collection (OP). *Ohio*: HAMILTON CO., Cincinnati, Burnett Woods, 27 Aug. 1959, Wagner and Suter, 7 males, 15 females, beech TH (JAWC); LORAIN CO., Oberlin, 29 July 1959, Wagner and Suter, 38 males, 45 females, maple TH (JAWC), 29 July 1959, Suter, 1 male, oak TCH (OP). *Kentucky*: HENDERSON CO., Audubon State Park, 28 Aug. 1959, Wagner and Suter, 4 males, 2 females, beech TH (JAWC). *Tennessee*: BLEDSOE CO., Fall Creek Falls State Park, 1 Sept. 1961, Steeves, Suter, Wagner, 4 males, 10 females, TH (JAWC); FRENTRESS CO., Jamestown, Jordan Motel, 13 Apr. 1963, Steeves, 1 male, maple TH (HS); FRANKLIN CO., Sewanee, 8 June 1958, 11 plus males, 3 plus females, hollow oak (HS, OP, JAW); HUMPHREYS CO., Hustburg, 5 June 1956, W. Snow, 2 males, 6 females, beech TH (OP); OVERTON CO., Standing Stone State Park, 2 July 1961, Steeves, 9 males, 18 females, beech TH with 1 male *E. longicollis* (HS); ROANE CO., Oak Ridge, AEC Controlled Area, 22 Aug. 1955, 1 male, 4 females, beech TH (OP); SEVIER CO., Great Smoky Mountains National Park, 4 males, 11 females; 7 males, 17 females; 1 male, 2 females; 5 males, 12 females; 3 males, 5 females; 3 males, 4 females, tree holes (OP), 15 Sept. 1953, H. Dybas, 1 male,

buckeye TH (FMNH). *Alabama*: CLAY CO., Talladega National Forest, 23 Sept. 1962, Steeves, 1 male, 1 female, tulip TH (HS); COLBERT CO., Maud, 15 June 1963, Steeves, 1 male, yellow poplar TH (HS); JACKSON CO., Pisgah, nr. Saltpeter Cave, 29 June 1958, Steeves, 2 plus males, 2 plus females, yellow poplar TH (HS, OP, JAW); JEFFERSON CO., Clay, nr. McClunney Alabama Caverns, 4 Mar. 1961, Steeves, 7 males, 8 females, oak TH (HS); LAWRENCE CO., Bankhead National Forest, Bee Branch Scenic Area (HS); MADISON CO., Maysville, Sharp's Cove, nr. Aladdin Cave, Suter, 2 males, 2 females, beech TH (JAWC), 11 May 1963, Steeves, 3 males, 12 females, beech TH (HS); Monte Sano State Park, 9 Apr. 1955, A. and H. Howden, 6 males, 8 females, oak TH (OP); MARSHALL CO., Grant, 25 May 1958, Steeves, 1 plus male, 2 plus females, beech TH (HS, OP, JAW); Union Grove, 2.5 mi. N., outside Old Blowing Cave, 27 June 1967, S. Peck and Fiske, 2 males, 9 females, beech TH (FMNH); PIKE CO., The Pocosin, nr. Troy, 6 Aug. 1961, Steeves and Patrick, 1 male, 9 females, oak TH (HS); SHELBY CO., Oak Mountain State Park (HS); nr. Helena (HS); WALKER CO., Devil's Ladder, nr. Jasper (HS). *Georgia*: RABUN CO., Rabun Bald, 30 May 1964, Steeves, 1 male, 2500 ft., base of cleft hemlock (HS). *Indiana*: MONTGOMERY CO., Shades State Park, 8 May 1961, Wagner, 2 males, 7 females, beech TH (JAWC); Pine Hills Extension-Shades, 24 Nov. 1961, Suter, 6 males, 13 females, beech TH; 23 Aug. 1960, H. Dybas, 4 males, 6 females, tulip poplar TH (JAWC); LAPORTE CO., Otis, 14 July 1960, Suter, 4 males, 2 females, beech TH (JAWC); Smith, 1 male, 1 female; beech TH, 10 Nov. 1959, Suter, 9 males, 11 females, maple TH, 3 females, black cherry TH, 1 female, sycamore TH (JAWC), 9 April 1956, H. S. Dybas, 10 males!, maple TH (JAWC); PARKE CO., Turkey Run State Park, 4 Nov. 1943, M. W. Sanderson, 1 male, soil cover in woods (OP), 18 Aug. 1959, Suter, 1 male, 2 females, sycamore TH; 2 males, 8 females; 17 males, 30 females, beech TH, 23 Sept. 1959, Suter, 3 males, 8 females; 1 male, 2 females, maple TH (JAWC); PORTER CO., Indiana Dunes State Park, 25 Aug. 1952, H. S. Dybas, 4 males, 2 females (OP); HANCOCK CO., nr. Cumberland, Wolfs Woods, 24 June 1966, R. Miller, 6 males, 9 females, maple TH, 8 males, 9 females, beech TH (JAWC). *Michigan*: ALLEGAN CO., Glenn, 16 Aug. 1949, S. Auerbach, 8 males, 22 females, TH; Douglas, 4 July 1949, Auerbach, 13 males, 47 females; 5 males, 7 females, TH (OP); ALGER CO., AuTrain, 6 mi. W. Shelter Bay, 16 Aug. 1953, Dybas, 1 male (JAWC); LIVINGSTON CO., E. S. George Reserve, 4 May 1960, Suter, 3 males, 4 females, squirrel nest on oak branch (JAWC); MUSKEGON CO., Montague, Pigeon Hill, 8-12 Aug. 1962, Wagner, 2 males, 5 females, red oak TH; 3 males, 10 females, beech

TH (JAWC); CHIPPEWA CO., Eckerman, 2 Sept. 1966, Suter, 1 male, 1 female, maple TH (JAWC); LUCE CO., 5 mi. W. McMillan, 31 Aug. 1966, Suter, 1 male, beech TH (JAWC); GRAND TRAVERSE CO., Bowers Harbor, Peninsula Drive, 23 Aug. 1966, Suter, 3 males, 15 females, maple TH; 28 Aug. 1966, Suter, 6 males, 7 females, beech TH (JAWC); BERRIEN CO., Buchanan, 9 Oct. 1948, S. Auerbach, 22 males, 23 females, (OP); Lakeside, Warren Woods State Park, Jan.–Dec. 1948–1953, Auerbach, Corley Park, 23 males, 41 females; 1 male, 9 females; 2 males, 7 females; 1 male, 5 females; 2 males; 3 males, 1 female; 3 males, 5 females; 3 males, 8 females; 9 males, 16 females, tree holes (OP), 27 males, 47 females; 3 Oct. 1959, Wagner, 6 males, 15 females, 10 Nov. 1959, Suter, 5 males, 18 females; 1 male, 9 females; 15 May 1961, Suter, 4 males, 10 females; 3 May 1961, Suter, 6 males, 7 females; 25 June 1966, Suter, 1 male, 16 females, all beech TH; 10 Nov. 1959, Suter, 21 males, 61 females, elm TH (JAWC); Stevensville, 1 male, hemlock TH (JAWC). *Illinois*: CHAMPAIGN CO., Urbana, Brownfield Woods, 6 males, 8 females, basal TH (INHS), Busey's Pasture, 1 male, 3 females, TH (INHS), Trelease Woods, 1 male, 7 females, TH (INHS), 1 male, 2 females TH (OP); COOK CO., Des Plaines, Carle Woods, 15 Dec. 1959, Suter, 16 males, 21 females, linden TH; 28 Mar. 1959, Suter, 4 males, 2 females, oak TH; 12 June 1963, Wagner, 1 male, 5 females, linden TH (JAWC); Palos Park, 13 Aug. 1949, S. Auerbach, 1 male (OP); Willow Springs, Paw Paw Woods, 23 Apr. 1960, Wagner, 1 male, oak TH; 13 July 1963, Wagner, 3 males, 7 females, maple TH, 1 male, 3 females, maple TH-mammal nest (JAWC); JERSEY CO., Pere Marquette State Park, Grafton, 31 Aug. 1959, Wagner, 7 males, 6 females, white oak TH (JAWC); LAKE CO., Channel Lake, Oak Point State Park, 16 Sept. 1960, Suter, 1 male, 4 females, elm TH (JAWC); LAWRENCE CO., Pinkstaff, 21 Mar. 1950, L. H. Tiffany, 1 male, 12 females, TH (OP); MADISON CO., Alton, 4 July 1959, Wagner, 1 male, 1 female, TH (JAWC); MCLEAN CO., Funks Grove, 2 Sept. 1962, Suter, 1 male, stump (JAWC); WILL CO., Monee, Raccoon Grove, 18 July 1959, Suter, 7 males, 6 females, maple TH; 1 male (OP), 7 May 1959, Suter, 9 males, 10 females, linden TH; 1 male, oak TH; 13 Sept. 1952, H. S. Dybas, 1 male, 5 females, maple TH (JAWC); TAZWELL CO., E. Peoria, 5 mi. N., 27 Dec. 1966, Suter, 1 male, 2 females, maple TH (JAWC); PULASKI CO., Villa Ridge, 8 Sept. 1959, Wagner and Suter, 5 males, 4 females, beech TH (JAWC); UNION CO., Wolf Lake, Pine Hills Ecology Area, 29–30 Aug. 1959, Wagner and Suter, 12 males, 20 females; 3 males, 4 females; 12 males, 19 females; 6 males, 5 females; 2 males, 3 females; 4 males, 3 females; 4 males, 13 females, all beech TH (JAWC). *Wisconsin*: ADAMS CO.,

Friendship, 3 May 1959, Wagner and Suter, 3 males, 7 females; 26 June 1959, 2 males, 9 females, oak TH; 19 Oct. 1966, Suter, 1 male, cottonwood TH (JAWC); GREEN CO., Twin Grove, 18 July 1959, Suter, 1 male, 1 female, linden TH (OP); SAUK CO., Devils Lake State Park, 23 Oct. 1960, Wagner, 2 males, 3 females, oak TH (JAWC). *Arkansas*: WASHINGTON CO., 29 Oct. 1939, M. W. Sander-son, 2 males, 9 Mar. 1940, 1 male (OP). *Iowa*: JACKSON CO., Ma-quoketa Caves State Park, 25 July 1968, S. Peck, 1 male, upland forest litter (JAWC). *Idaho*: LATAH CO., Juliaetta, 17 May 1952, W. F. Barr, "several," 1083 ft. elevation (Univ. of Idaho). The total number examined was approximately 1722 (607 males, 1115 females with a ratio of 1 male to 1.83 females).

HABITAT: The preferred habitat is the loose, moist, decayed wood debris within hollow trees, especially basal tree holes in beech (*Fagus grandifolia*) and maple (*Acer saccharum*).

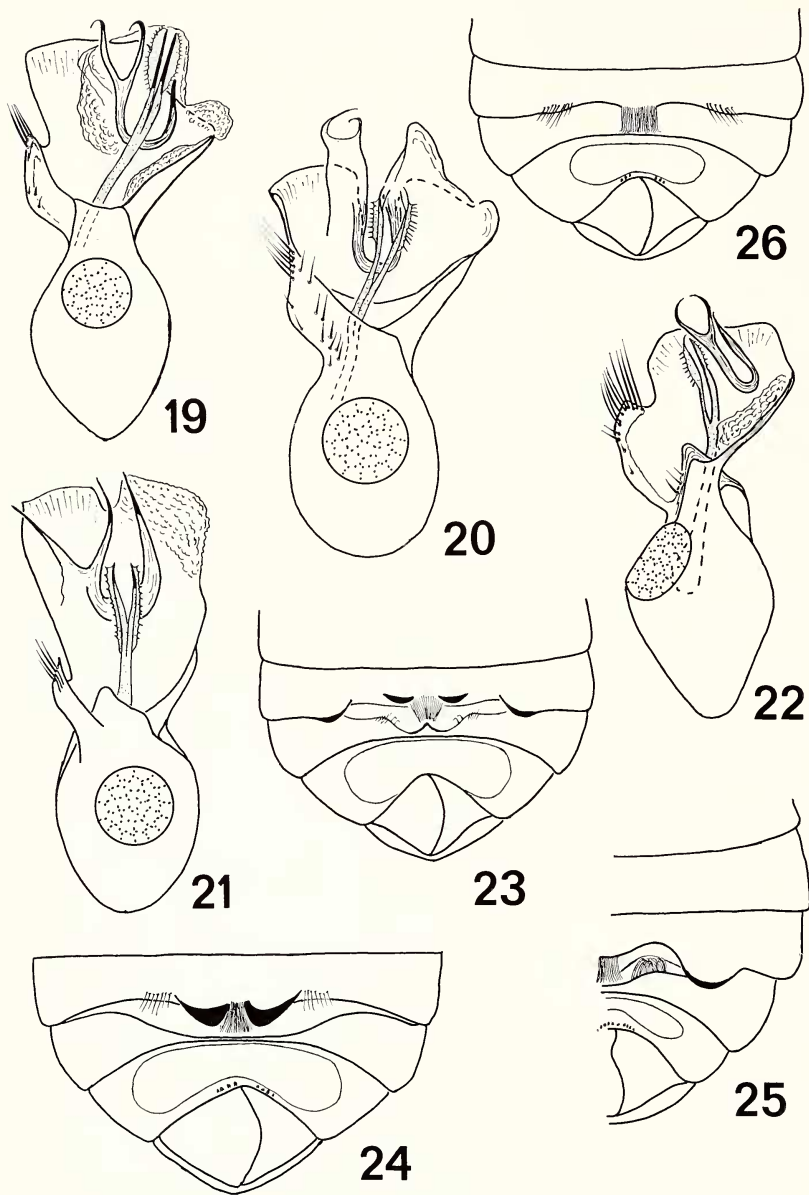
***Euplectus longicollis* Casey**

Euplectus longicollis Casey, 1884, p. 99. Type locality: Deer Park, Garrett Co., Maryland, Type male USNM. Subsequent references: Brendel and Wickham, 1890, p. 65 (descript., distr. data). Raffray, 1911, p. 33 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 27 (descript., key ref.).

DISCUSSION: This species was described from a single male. It is most closely related to *confluens* and although male fourth and fifth sternal characters provide distinct separation, the occurrence of both species in the same tree holes of beech-maple forests in Parke County, Indiana and Union County, Illinois suggests a lack of gene flow between them. I have not been able to recognize any intermediate phenotypes.

MEASUREMENTS OF TYPE MALE: Head .264 mm long $\times$.300 mm wide, pronotum .316 mm long $\times$.306 mm wide, elytra .440 mm long $\times$.426 mm wide, abdomen .440 mm long $\times$.404 mm wide, tergite ratio 1-1-1-2-2, sternite ratio ?-.5-1-1-.2-.5-1, basal abdominal carinae separation .088 mm first, .105 mm second, antenna length .404 mm.

DESCRIPTION: General habitus identical to *confluens*, separated from *confluens* by following characters. Male venter: fourth sternite with median apical setal tuft which extends posteriorly over fifth, darkened lamina on each side of tuft; fifth sternite medially impressed, each side bearing cluster of sparse setae (as in *confluens*), apical margin simple; sixth sternite with median subreniform impression and row of three to four small sensilla each side of center apical margin (in eight specimens from Indiana, Illinois, Pennsylvania, average 7.3,



FIGS. 19-26. *confluens* group. Figs. 19 & 26. *Euplectus confluens* Le-Conte. 19. Aedeagus. 26. Venter of male. 20 & 25. *Euplectus karsteni* (Reichenbach). 20. Aedeagus. 25. Venter of male. Figs. 21 & 23.

range from five to eight total sensilla); seventh sternite with carina arcuate to left (fig. 24).

Aedeagus: Left lateral lobe (fig. 22) with four to 10 setae (in 10 specimens over total range, average 7, modal number 4), average higher than for *confluens*.

MATERIAL EXAMINED: CANADA: *Ontario*: ESSEX CO., Tilbury, 5 Sept. 1967, 1 male, 1 female, sifting, K. Stephan (JAWC).

UNITED STATES: *Maryland*: GARRETT CO., Deer Park, 1 male (Type, USNM), 25 July 1959, 1 male, Wagner and Suter, sawdust (topotype, JAWC); MONTGOMERY CO., Island SE of Plummers, 8 Sept. 1964, 1 male, litter at log, Suter (JAWC). *Washington, D.C.*: United States National Arboretum, 27 July 1959, 1 male, 1 female, maple TH (JAWC). *Pennsylvania*: PHILADELPHIA CO., Frankford, 1 male, 1 female (OSUC); WESTMORELAND CO., Latrobe, St. Vincent, 28 July 1959, 4 males, 4 females, log mold (JAWC), 1 male, 1 female, black cherry tree crotch, (OP), 2 males, 2 females, Fall Collection (MCZC), 4 males, (OSUC). *Ohio*: HAMILTON CO., 2 males (CMNH); MAHONING CO., Swamp, N. Jackson, 1 Sept. 1964, 3 males, 1 female, beech stump, Suter (JAWC). *South Carolina*: FLORENCE CO., Florence, 29 Mar. 1960, 3 males (V. M. Kirk). *North Carolina*: MACON CO., Norton, Coweeta Hydrology Lab., 31 May 1964, H. R. Steeves, Jr. and J. D. Patrick, Jr., 4 males, 5 females, 2250 ft., in sawdust, with *E. filiformis* (HS). *Tennessee*: FENTRESS CO., Jamestown, Jordan Motel, 13 Apr. 1963, Steeves and Patrick, 1 male, 3 females, yellow poplar TH; 1 male, maple TH, with 1 male *E. confluens* (HS); OVERTON CO., Standing Stone State Park (HS); PICKETT CO., Pickett State Park, (HS). *Alabama*: JACKSON CO., Pisgah, nr. Saltpeter Cave, 29 June 1958, Steeves, 1 male, 2 females, hollow yellow poplar debris (HS); LAWRENCE CO., Bankhead National Forest, Bee Branch Scenic Area (HS). *Kentucky*: HENDERSON CO., Audubon State Park, 28 Aug. 1959, Wagner and Suter, 3 males, 2 females, beech TH (JAWC). *Indiana*: MONTGOMERY CO., Shades State Park, 18 Aug. 1959, 2 males, beech TH, 23 Sept. 1959, Wagner, 3 males, 5 females, maple TH, 8 May 1961, Suter, 3 males, 5 females, maple TH (JAWC). *Illinois*: JACKSON CO., Giant City State Park, 22 Aug. 1944, M. W. Sanderson, 1 male, 1 female, floor litter (OP); POPE CO., Herod, 12 Oct. 1933, Frison and Ross, 6 males, 2 females, log mold,

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Euplectus filiformis (Casey). 21. Aedeagus. 23. Venter of male. Figs. 22 & 24. *Euplectus longicollis* Casey. 22. Aedeagus, three-quarter dorsal view. 24. Venter of male.

(INHS), 12 Oct. 1933, H. Ross, 1 male, 1 female (OP); UNION CO., Ware, 1 male, 3 females, log mold (INHS), 3 Feb. 1934, Frison and Mohr, 1 male, log mold (OP); Wolf Lake, Pine Hills Ecology Area, 29-30 Aug. 1959, Wagner and Suter, 39 males, 44 females; 11 males, 18 females; 1 male, 4 females; 9 males, 8 females, all beech TH (JAWC). The total number examined was about 227 (113 males, 114 females).

HABITAT: The preferred habitat is tree holes and log mold, particularly in climax forests.

***Euplectus filiformis* (Casey), new combination**

Leptoplectus filiformis Casey, 1908, p. 268. Type locality: St. Vincent, Latrobe, Westmoreland Co., Pennsylvania. Type male, USNM no. 38608. Subsequent references: Raffray, 1911, p. 35 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 35 (descriptive key).

DISCUSSION: This is a slender species which Casey placed in *Leptoplectus* perhaps because of its small size. It has nude vertexal foveae, two sensory fossae on the eleventh antennal segment, the seventh sternite has a carina arcuate to the left, and other features typical of *Euplectus*. It belongs in the *confluens* group on the basis of male venter and aedeagal form. It is the least common species in the group, and the only one with spined mesotrochanters.

MEASUREMENT OF TYPE MALE: Head .228 mm long $\times$.270 mm wide, pronotum .228 mm long $\times$.264 mm wide, elytra .352 mm long $\times$.352 mm wide, abdomen .389 mm long $\times$.340 mm wide, tergite ratio 1-1-1-1.5-1, sternite ratio .5-1-1-1-.2-1.2, basal abdominal carinae maximum separation .075 mm, antennal length .352 mm, club width .070 mm.

DESCRIPTION: General habitus as for group, but smaller size; separated from allies by following features. Legs: mesotrochanter with short spine. Male venter: fourth sternite with mesoposterior tuft of setae which converge in truncate point and recurve sharply at tips over fifth, small dark lamina laterally adjacent to tuft (as in *longicollis*, but smaller); fifth sternite with basal impression in middle third, posterior to impression transverse row of three tubercles, lateral two large, with abundant straight and recurved setae, central tubercle small, acute, not setiferous; sixth sternite with rather deep subreniform impression and row of eight small, median anteapical sensilla (one specimen only from Indiana checked for sensilla); seventh sternite arcuate to left (fig. 23).

Aedeagus: Left lateral lobe small, pointed, with about four setae, ventral lobe long, with shallow median notch, anteapical membrane

bearing unusually deep "horseshoe lobe" with left ramus broadly divergent, specimens of four known localities agree with figure 21.

MATERIAL EXAMINED: *Pennsylvania*: WESTMORELAND CO., Latrobe, St. Vincent, 1 male (Type, USNM), 1 male (J. Schmitt coll'n. FMNH). *Ohio*: HAMILTON CO., Cincinnati, 1 male, 1 female (paratypes, USNM), 12 males, 7 females, four collection dates (CMNH). *Indiana*: MONTGOMERY CO., Shades State Park, Pine Hills Extension, 24 Nov. 1961, Suter leg., 1 male, hemlock floor litter, (JAWC). *North Carolina*: MACON CO., Norton, Coweeta Hydrology Lab., 31 May 1964, Steeves, 3 males, 5 females, 2250 ft. in sawdust pile with 4 males, 5 females of *E. longicollis* (HS). The total number examined was 32 (19 males, 13 females).

HABITAT: The only known habitats are hemlock floor litter and sawdust.

Euplectus (Diplectellus) karsteni (Reichenbach)

Euplectus (Diplectellus) karsteni (Reichenbach), 1816, p. 71. Type locality: central Europe. Subsequent references: Raffray, 1908, p. 87 (cat. citation), 1910, p. 229 (distr. data, descript.), 1911, p. 32 (cat. citation). Jeannel, 1950, p. 105, 116 (key ref., descript., distr. data, figs., does not agree with Raffray's variations but considers each different species). Pearce, 1957, p. 17 (key ref., distr. data). Karaman, 1962, p. 161 (descript., distr. data, figs.) Besuchet, 1974, p. 323 (key ref., distr. data, aedeagus fig., synonymies including *iowensis*).

Euplectus iowensis Casey, 1893, p. 456. Type locality: Cedar Rapids, Linn Co., Iowa (by my designation), Type male USNM no. 38623. Subsequent references: Raffray, 1911, p. 33 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 28 (descript., key ref.). Park and Wagner, 1961, p. 16 (synonym of *confluens*).

DISCUSSION: Raffray listed eight synonyms with six varieties for *karsteni* in 1911; Jeannel felt that the varieties would prove to be valid species, but Besuchet (1974) later placed two more European species, *laticeps* Guillb. and *barbarus* Jeannel, and North American *iowensis* Casey in synonymy. By exchanging specimens of European *karsteni* and N. American *iowensis* with Besuchet it was evident to both of us that the latter is a synonym. The characters of the male venter and aedeagus are conspecific within ranges of variation acceptable for the genus. The Type and four paratypes of *iowensis* were labeled simply Iowa. One paratype was labeled "dar Rap" Iowa, with the edges of the label cut off. I have not seen the Type of *E. karsteni*. The description here is from Nearctic populations unless noted.

MEASUREMENTS OF IOWENSIS TYPE MALE: Head .228 mm long × .316 mm wide, pronotum .246 mm long × .299 mm wide, elytra

.404 mm long $\times$.422 mm wide, abdomen .440 mm long $\times$.389 mm wide, tergite ratio 1-1-1-2-1, sternite ratio .8-1-1-.6-.2-1.2, antenna length .404 mm.

DESCRIPTION: General habitus identical with *confluens*, separated from *confluens* by following characters. Male venter: relatively flattened, fourth sternite with mesoposterior tuft of setae flanked on each side by concave indentations of posterior margin which becomes darkened lamina in lateral third; fifth sternite with basal impressions complementary to indentations of fourth, within impressions dense cluster of strongly recurved setae; sixth sternite with row of five to eight anteapical sensillae each side of center (Europe: two specimens from Switzerland -12.5, 1 from France -13; North America, 1 from Montreal, Canada -12, 4 from Wisconsin -12.7, 1 from Minnesota -14, 1 from Michigan -14, 6 from Illinois -13.1; total average for 13 North American specimens -13.16, range 11 to 15); seventh sternite with carina arcuate to left (fig. 25).

Aedeagus: Anteapical membrane distinct, left lateral lobe (fig. 20) with 6 to 12 setae (in 12 Nearctic specimens over total range, average number 8.3, modal number 8).

MATERIAL EXAMINED: EUROPE: SUISSE-GENEVE: Geneve, Florissant, Zeudon, 5 May 1962, C. Besuchet leg., 5 males, 6 females; FRANCE: Gard: Nimes, 9 Feb. 1953, J. Therond leg., 4 males, 4 females (all determined by C. Besuchet, JAWC). In addition I have examined 30 specimens collected by W. Sixl with the following unknown code data: H 30Ø, D 8:1:1966, F Autal, B Espe (JAWC). NORTH AMERICA: CANADA: Quebec: Montreal, 29 June 1898, (OP). Ontario: ESSEX CO., Tilbury, 26 Mar., 1 male; 2 June, 2 males; 5 Sept., 3 males, 1 female all 1967, K. Stephan leg., sifting (JAWC). UNITED STATES: New York: Long Island, 1 male (ICCM). Washington, D.C.: 2 Sept. 1964, Suter, 1 male, 9 females, tulip tree TH (JAWC). Pennsylvania: WESTMORELAND CO., Latrobe, St. Vincent, 1 male, 5 females, maple TH (JAWC). Ohio: 1 male, (ICCM); HAMILTON CO., Cincinnati, 4 males (CMNH). Michigan: ALLEGAN CO., Saugatuck, 1 male (OP); BERRIEN CO., S. of Naomi, 3 Apr. 1961, Suter, 1 male, from moss (JAWC); MUSKEGON CO., Montague, Pigeon Hill, 13 Aug. 1962, Wagner, 2 males, oak TH, (JAWC). Illinois: COOK CO., Lake Street Woods, 1 Oct. 1952, J. Camin, 1 male (OP), Evanston, Aug. 1958, Suter, 3 males, 4 females, elm TH (JAWC), Skokie, Peebles Stable, Sept. 1960, Wagner and Suter, 2 males, 1 female; Mar. 1961, 21 males, 33 females; Apr. 1961, 9 males, 18 females, composted horse manure (JAWC); DUPAGE CO., Wayne, 28 Dec. 1952, J. Camin, 1 male, 1 female (OP); LAKE CO., Highland Park, 2 Apr. 1950, R. Crossman, 1 male, TH (OP), Rosecrans, 24

May 1960, Wagner, 1 male, 3 June 1960, Suter, 1 female, old sawdust (JAWC); MCLEAN CO., Bellflower, 21 Oct. 1933, Park, 2 males, 2 females (OP). *Iowa*: 11 males, 2 females, (ICCM), F. C. Fletcher collection, 2 males (OP), 2 males, (OSUC); JOHNSON CO., Iowa City, 2 males, 1 female, Fall collection (MCZC); LINN CO., Cedar Rapids (Type male and 4 paratypes of *iowensis* USNM). *Wisconsin*: ADAMS CO., Friendship, 16 June 1960, Suter, 1 male, 2 females, oak TH; 10 Apr. 1961, Wagner, 7 males, 9 females, old haystack (JAWC); WALWORTH CO., Pell Lake, 16 Sept. 1960, Suter, 4 males, 9 females, old corn cobs (JAWC); KENOSHA CO., Kenosha, 12 Nov. 1962, Suter, 1 male, 1 female, birch TH (JAWC); WASHINGTON CO., Colgate, 19 June 1950, R. Howard, 2 males, 1 female, hickory TH (OP). *Minnesota*: BECKER CO., Smoky Hills State Forest, Two Inlets, 20–21 June 1961, Wagner-Suter, 3 males, 26 females, old haystack (JAWC). The total number examined was 275 (105 males, 136 females, plus 34 unsexed).

HABITAT: Most frequently found in composted or well rotted haystacks, corncob piles, horse manure, and occasionally in tree holes.

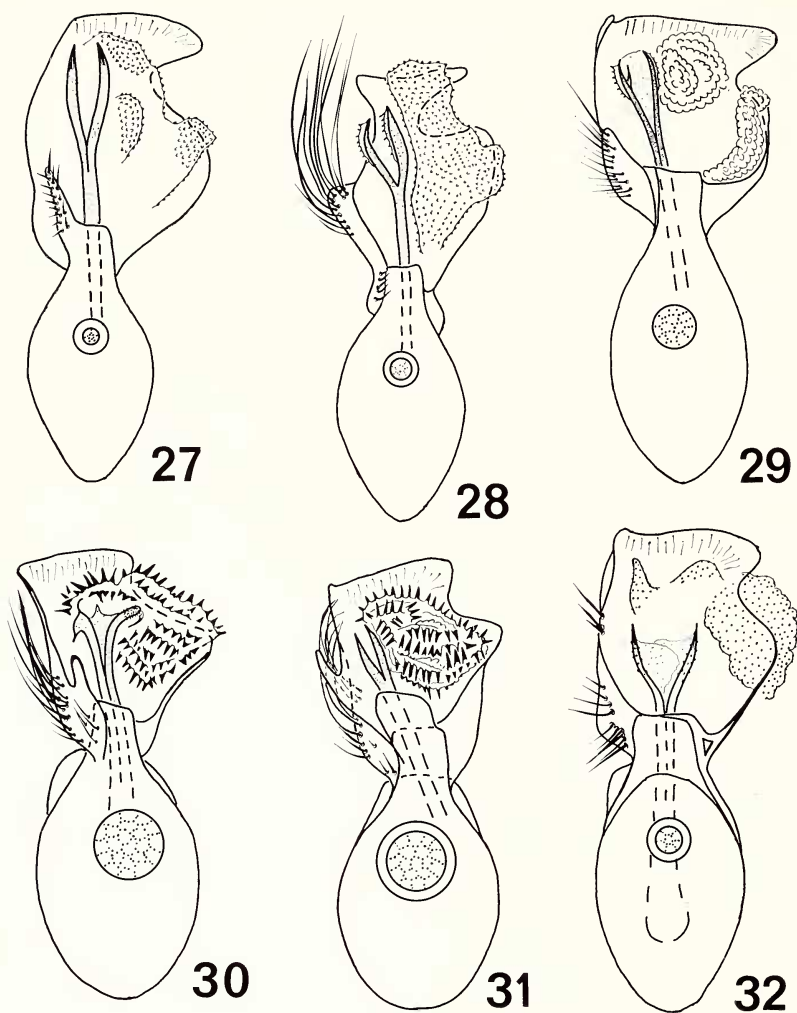
CALIFORNICUS GROUP

The male venter of the *californicus* group is relatively simple with the sixth sternite impressed medially and bearing papilliform sensilla (*californicus* has not been examined for these sensilla, but I assume that they are present); the aedeagi show group conformation. None of the species has been collected in tree holes, a common habitat of the *confluens* group, but log mold and under loose bark seem to be preferred habitats. Although the data are meager, I feel this group is associated with conifer forests, and several collections have come from high elevations. *E. signatus* is not considered part of this group, but is an introduced European species.

Euplectus californicus Casey

Euplectus californicus Casey, 1887, p. 476. Type locality: California, Placer Co., Lake Tahoe, under bark. Type male USNM no. 38622. Subsequent references: Brendel and Wickham, 1890, p. 70 (descript.). Raffray, 1911, p. 33 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 28 (descript., key ref.). Park and Wagner, 1961, p. 17 (descript. key).

DISCUSSION: This high Sierra species is known only from the type series. The sixth sternite with rounded tubercles and carinoid margins of the impression are diagnostic. The type was not examined for



FIGS. 27-32. *californicus* group aedeagi. 27. *Euplectus californicus* Casey, aedeagus (.264 mm long). 28. *Euplectus acomanus* Casey, aedeagus (.228 mm long). 29. *Euplectus idahoensis* Park & Wagner, aedeagus. 30. *Euplectus duryi* Casey, aedeagus from Illinois male. 31. *E. duryi* Casey, aedeagus from Idaho male. 32. *Euplectus elongatus* Brendel, aedeagus.

sensilla on the sixth sternite. The aedeagus suggests that *californicus* is most closely related to *idahoensis*.

MEASUREMENTS OF TYPE MALE: Head .228 mm long $\times$.334 mm wide, pronotum .281 mm long $\times$.334 mm wide, elytra .457 mm long $\times$.457 mm wide, abdomen .440 mm long $\times$.422 mm wide, antenna .422 mm long $\times$.088 mm wide, tergite ratio 1-1-1-1.8-1, sternite ratio 1-1-1-1-2-1-1.2.

DESCRIPTION: Head transverse, rather large, surface coarsely, deeply, and rather densely punctate; pronotal disc with slightly elongate fovea near center, prosternum punctate as for head. Male venter: sternites 1 through 5 simple; sixth sternite with large and very deep impression sloped from apex to base evenly with deepest part at base, lateral margins evenly carinoid, lateral tubercles small, rounded; seventh sternite with carina arcuate to left (fig. 35).

Aedeagus: Similar in form to *elongatus* and *idahoensis* with anteapical membrane finely tuberculate, left lateral process with several very short setae (fig. 27).

MATERIAL EXAMINED: *California*: PLACER CO., Lake Tahoe, June 1887, Casey, 1 male Type, 2 females, paratypes, under bark (USNM).

Euplectus acomanus Casey

Euplectus acomanus Casey, 1908, p. 265. Type locality: Cloudcroft, Otero Co., New Mexico. Type male USNM no. 38624. Subsequent references: Raffray, 1911, p. 33 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 29 (descript., key ref.). Park and Wagner, 1961, p. 17 (descript. key, fig.).

DISCUSSION: This infrequently collected species shows a disjunct range from New Mexico to Indiana to Maryland! It is most closely allied to *elongatus* by the male venter and aedeagus, and is separated by the anteapical constriction of ventral lobe, and long setae on the left lateral lobe of the aedeagus.

MEASUREMENTS OF TYPE MALE: Head .246 mm long $\times$.352 mm wide, pronotum .299 mm long $\times$.316 mm wide, elytra .440 mm long $\times$.440 mm wide, abdomen .475 mm long $\times$.415 mm wide, antenna .440 mm long $\times$.088 mm wide, tergite ratio 1-1-1-1.8-1.2, sternite ratio 1-1-1-1-5-9-1.3, basal abdominal carinae maximum separation .09 mm.

DESCRIPTION: Head large, wider than pronotum, basally truncate, sides parallel, surface coarsely and densely punctate everywhere except in moderate frontal depression which connects with short, parallel sulci, ventral surface coarsely and densely punctate; pronotum sparsely punctulate, discal fovea large and elongate, prosternum coarsely punctate. Male venter: sternites 1 through 5 simple; sixth sternite

with deep, glabrous rounded impression in median third, each side with row of six to seven papilliform sensilla from margin of impression obliquely toward side; seventh sternite impressed at base, carina arcuate to left (fig. 37).

Aedeagus: Ventral lobe with anteapical constriction, left lateral lobe with many long setae which extend beyond ventral lobe (fig. 28).

MATERIAL EXAMINED: *New Mexico*: OTERO CO., Cloudcroft, 6 June 1905, Warren Knaus, 1 male Type, 2 males, 2 females paratypes, at 9000 ft. (USNM), 2 males, 1 female—topotypes, probable paratypes, from F. C. Fletcher collection (OP), 2 males—topotypes, probable paratypes, in Fall collection (MCZC). *Indiana*: PORTER CO., Ogden Dunes, 26 Oct. 1946, L. Jones, 1 male, under bark pine log (OP). *Maryland*: BALTIMORE CO., Baltimore, 22 Mar., 1 male, under bark of white pine (OP). The total number examined was 12 (9 males, 3 females).

HABITAT: Under pine bark.

***Euplectus idahoensis* Park and Wagner**

Euplectus idahoensis Park and Wagner, 1961, p. 17. Type locality: Idaho, Latah Co., Moscow Mountain. Holotype male CASC (on loan from University of Idaho?).

DISCUSSION: This species was described from a single male. It is most closely related to *elongatus* on the basis of male venter and aedeagus, and additional specimens could reveal *idahoensis* to be a western variety of *elongatus*.

MEASUREMENTS OF HOLOTYPE MALE: Head .264 mm long $\times$.334 mm wide, pronotum .317 mm long $\times$.352 mm wide, elytra .476 mm long $\times$.520 mm wide, abdomen — $\times$.405 mm wide, antenna .475 mm long $\times$.070 mm wide, tergite and sternite ratios as for genus, total length 1.4 mm.

DESCRIPTION: Head wider than long, vertex coarsely punctate lateral to foveae, front and ambient sulcus glabrous, ventral surface coarsely punctate; pronotal disk with deep oval foveoid impression over half discal length, prosternum less coarsely punctate than gula. Male venter: sternites 1 through 5 simple; sixth sternite deeply impressed for median half of width, narrower and deeper to base, lateral margins tuberculoid and elevated to apex with seven (right) or nine (left) papilliform sensilla in oblique row; seventh sternite with carina arcuate to left (fig. 36).

Aedeagus: Similar to *elongatus*, but distal phallic rami not microtuberculate; left lateral lobe with relatively short, laterally or apically directed setae (fig. 29).

MATERIAL EXAMINED: *Idaho*: LATAH CO., Moscow Mountain, 25 Apr. 1953, W. F. Barr, 1 male, Holotype, at 3000 ft. in *Salix* leaf litter (CASC).

Euplectus elongatus Brendel

Euplectus elongatus Brendel, 1893, p. 281. Type locality: Chestnut Ridge, Youngstown, Westmoreland Co., Pennsylvania. Lectotype male ANSP no. H9447. Subsequent references: Raffray, 1911, p. 33 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 28 (descript., key ref.).

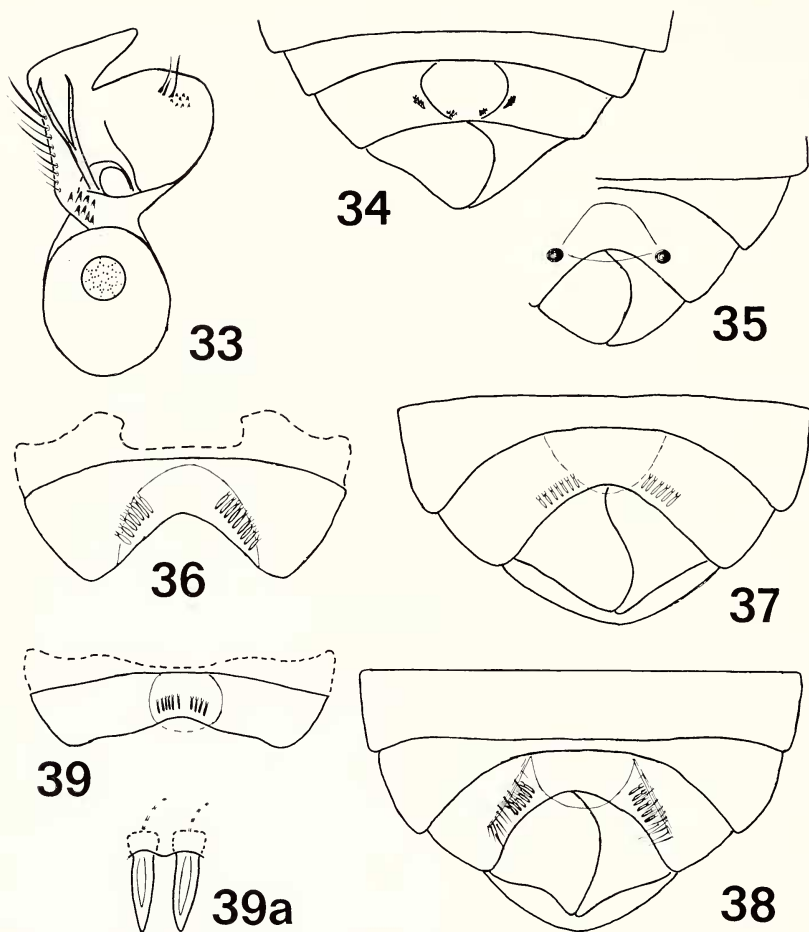
DISCUSSION: The lectotypic specimen in the Horn collection bears a label "Pen" with the top of the "e" filled in red. This is assumed to designate the type locality cited by Brendel. The lectotype was designated only by specimen label, October 27, 1948, O. Park, but was not published. I confirm this designation. *E. elongatus* is most closely related to *acomanus* and *idahoensis* on the basis of the male venter and aedeagus, but the distal rami of the phallus are microtuberculate, and the left lateral lobe bears several posteriorly directed setae.

MEASUREMENTS OF LECTOTYPE MALE: Head .246 mm long $\times$.352 mm wide, pronotum .299 mm long $\times$.352 mm wide, elytra .475 mm long $\times$.475 mm wide, abdomen .528 mm long $\times$.440 mm wide, antenna .475 mm long, tergite ratio 1-1-1-2-1, sternite ratio 1-1-1-1-.2-8-1.5, basal abdominal carinae .088 mm at base, .12 mm maximum separation.

DESCRIPTION: Head transverse, tempora rounded, vertex and front subglabrous, foveae small, nude, surface punctate posterolateral of foveae as for *duryi*, ventral surface with medium punctations; pronotum discal fovea oval, prosternum sparsely punctate. Male venter: sternites 1 through 5 simple; sixth sternite with deep, ogival, glabrous depression in median third, from base of depression, each side, elongate, hirsute tumulus with five to seven papilliform sensilla in diagonal row (lectotype six right, five left; topotype five right, seven left); seventh sternite depressed at base, carina arcuate to left (fig. 38).

Aedeagus: Distal ramus of phallus strongly bifurcate, microtuberculate; left lateral lobe with short setae directed posteriorly, laterally, and apically, not recurved nor reaching apex (fig. 32).

MATERIAL EXAMINED: *Pennsylvania*: WESTMORELAND CO., Youngstown, Chestnut Ridge, Jerome Schmitt, 1 male lectotype, Horn collection (ANSP), 14 males, 5 females topotypes (probable paratypes, all bear "Pen" label as cited above) Ulke collection (ICCM); Latrobe, St. Vincent, 2 males, 2 females, Fall collection (MCZC). *Maryland*: MONTGOMERY CO., Cabin John, 7 June 1965, Suter, 1



FIGS. 33-39. Figs. 33-34. *Euplectus signatus* (Reichenbach). 33. Aedeagus. 34. Venter of male. Figs. 35-39. *californicus* group male venters. 35. *Euplectus californicus* Casey, sternites 5-7. 36. *Euplectus idahoensis* Park & Wagner, sternite 6. 37. *Euplectus acomanus* Casey, sternites 5-7. 38. *Euplectus elongatus* Brendel, sternites 4-7. 39. *Euplectus duryi* Casey, sternite 6. 39a. Detail of papilliform sensilla.

male, subcortical log with polypore (JAWC). Illinois: CHAMPAIGN CO., Urbana, Trelease Woods, 28 Apr. 1951, R. K. Benjamin, 1 male, leaf mold (INHS). The total number examined was 26 (19 males, 7 females).

HABITAT: Leaf litter and under bark of decaying log.

Euplectus duryi Casey

Euplectus duryi Casey, 1908, p. 266. Type locality: Cincinnati, Hamilton Co., Ohio. Type male USNM no. 38625. Subsequent references: Raffray, 1911, p. 33 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 30 (descript., key ref.).

Euplectus barri Park and Wagner, 1961, p. 17. Type locality: Moscow, Latah Co., Idaho. Type male CASC (on loan from Univ. of Idaho?).
New synonym.

DISCUSSION: *E. duryi* has been frequently found in southeastern and midwestern states, and recent collections show populations present from Maine to Idaho encompassing the greatest range for any species in the *californicus* group. There is some variation of characters across this range and *barri* falls well within the species. When *barri* was described, *duryi* had not been studied in detail, and unfortunately the three-quarter angle published drawing of *barri*'s aedeagus added confusion. I reexamined the *barri* Type and established its synonymy both on male venter and aedeagal form.

MEASUREMENT OF TYPE MALE: Head .246 mm long $\times$.340 mm wide, pronotum .281 mm long $\times$.340 mm wide, elytra .440 mm long $\times$.440 mm wide, abdomen .475 mm long $\times$.412 mm wide, antenna .40 mm long, tergite ratio 1-1-1-2-1, sternite ratio 1-1-1-1-.5-1-1.2, basal abdominal carinae separation .123 mm apical, .088 mm basal.

DESCRIPTION: Head transverse, vertex impunctate glabrous, tempora lateral to small nude vertexal foveae, coarsely but not closely punctate, ventral surface glabrous in median fourth to sixth; prosternum shining, sparsely punctulate. Male venter: sternites 1 through 5 simple; sixth sternite with small, deep impression in median fourth bearing anteapical transverse row of six to 12 small, papilliform sensilla (in nine specimens over total range, average 9.4, range 6 to 11; Maine specimen -6 with slight separation at center, Illinois -11, Colorado -10 with no separation, Idaho -11 with slight separation); seventh sternite carina arcuate to left (fig. 39).

Aedeagus: Left lateral lobe with thumblike projection and numerous long setae, anteapical membrane bearing numerous long spikes or spines (fig. 30—Illinois, 31—Idaho).

MATERIAL EXAMINED: *Ohio:* HAMILTON CO., Cincinnati, Charles Dury, 1 male Type (USNM), 3 males, 2 females (CMNH), 1 male, Fall collection (MCZC). *Maine:* HANCOCK CO., W. Gouldsboro, 21 Oct. 1967, S. Peck, 1 male, spruce duff (FMNH). *Washington, D.C.:* 1 male (ICCM). *Maryland:* MONTGOMERY CO., Takoma Park, 16 Oct. 1951, D. G. Kissinger, 1 male, log mold (JAWC); CARROL CO., nr. Marriottsville, 26 July 1959, Wagner and Suter, 1 male, log mold

(JAWC). *Pennsylvania*: 1 male Fall collection (MCZC); PHILADELPHIA CO., N. Philadelphia, 1 male (OSUC); CHESTER CO., West Chester, 1 male, 1 female (OSUC); New London, 2 Oct. 1954, R. S. Howard, 1 male (OP); WESTMORELAND CO., Latrobe, St. Vincent, 4 males (OSUC), J. Schmitt and/or C. A. Schaffer?, 18 Apr. 1895, 2 males; 29 May 1895, 1 male; 1 May 1895, 1 male; 17 Sept. 1896, 1 female (OP); 16 May 1896, J. Schmitt, 1 male; 3 June 1896, J. Schmitt, 1 male, Schmitt collection (FMNH). *Tennessee*: 1 male, 5 females (ICCM); PICKETT CO., Pickett State Park, Steeves, 1 male, log mold (HS). *North Carolina*: JACKSON CO., Balsam, 1 male (OSUC). *Georgia*: FLOYD CO., Coosa, 1 male (CMNH). *Illinois*: OGLE CO., 5 mi. S. of Oregon, Castle Rock Ravine, 8 Nov. 1958, Suter, 1 male, log mold (INHS); VERMILION CO., Oakwood, 27 Mar. 1934, 1 male (OP); WILL CO., 1 mi. N. of Frankfort, Hickory Creek, 31 Aug. 1952, H. S. Dybas, 1 male (OP). *Wisconsin*: ADAMS CO., Friendship, Parklan, 7 Apr. 1960, Wagner, 1 male, pine duff nr. log (JAWC). *Iowa*: JOHNSON CO., Iowa City, 21 June, H. F. Wickham, 4 males, 4 females, F. Psota collection (FMNH). *Colorado*: LARIMER CO., Pingree Park (CSU Forestry Station) at Fall Creek, July-Aug. 1965, Wagner, 1 male, 6 females, 9520 ft. in old sawdust under bark of slash (JAWC). *Idaho*: BEAR LAKE CO., 11 mi. NW of Ovid, 4 Aug. 1959, C. C. Hoff, 1 male, 1 female, 7200 ft. in woody debris from rotten fir (?) stump; FRANKLIN CO., 16 mi. W of Ovid, 4 Aug. 1959, Hoff, 1 male, 6800 ft., debris from aspen logs and stump (JAWC); LATAH CO., Moscow, base of Moscow Mountain, 5 May 1949, W. F. Barr, 1 male (CASC, Holotype of *barri*). The total number of specimens examined was 60 (40 males, 20 females).

HABITAT: Most records are from log mold; sawdust and litter in spruce and fir forests have provided a few specimens.

***Euplectus (Diplectellus) signatus* (Reichenbach)**

Euplectus signatus (Reichenbach), 1816, p. 73. Type locality: Central Europe. Subsequent references: Raffray, 1910, p. 210 (descript., distr. data); 1911, p. 31 (cat. citation). Jeannel, 1950, p. 114 (descript., key ref., distr. data, figs.). Pearce, 1957, p. 16 (key ref., distr. data). Karaman, 1962, p. 164 (descript., distr. data, figs.). Besuchet, 1974, p. 320 (descriptive key, distr. data, figs.).

DISCUSSION: This species is evidently introduced from Europe and is the third record of Holarctic distribution within the family. It is widely distributed in Europe, "All of France, common in leaf mold and plant debris. Distributed in Europe to the Caucasus, Great Britain, but not in Ireland" (Jeannel, 1950) but, thus far is restricted to

domestic and farm compost in the eastern part of North America. It has been collected with *karsteni* from manure compost in Illinois.

MEASUREMENTS OF MALE FROM CENTRAL WISCONSIN: Head .228 mm long $\times$.299 mm wide, pronotum .281 mm long $\times$.299 mm wide, elytra .404 mm long $\times$.422 mm wide, abdomen .563 mm long $\times$.404 mm wide, antenna .390 mm long, tergite ratio 1-1-1-1.2-1.5, sternite ratio 1-1-1-1.4-.8-1, basal abdominal carinae maximum separation .140 mm.

DESCRIPTION: Head relatively small, sparsely punctulate, vertex convex, foveae small nude, U-shaped sulcus sloping in front, ventral surface of head and pronotum moderately punctate, metasternum with shallow median sulcus, pronotum convex with small elongate discal fovea, elytron with four antebasal foveae in two depressions. Male venter: sternites 1 through 4 simple; fifth sternite slightly medially depressed; sixth sternite with deep rounded glabrous depression in middle third which contains two to three anteapical papilliform sensilla each side, each posterior angle tumid with short setae and three to five contiguous papilliform sensilla; seventh sternite convex, with carina arcuate to left (fig. 34).

Aedeagus: Ventral lobe broadly and deeply incised on right; phallic rami long, diverging near middle (fig. 33).

MATERIAL EXAMINED: EUROPE: POLAND: Kelecsenyi, Settin, 2 males, Psota collection (FMNH). FRANCE: *Indre-Et-Loire*: La Haye, 1 male, 1 female, identified by R. Jeannel (OP). NORTH AMERICA: CANADA: *Quebec*: Laurentide Park, Camp Le Relais, 29 Aug. 1956, 3000 ft., H. S. Dybas, 2 males, wood shavings and straw compost nr. domestic rabbit hutch (FMNH). *Ontario*: ESSEX CO., Tilbury, 2 June 1967, 3 males; 15 Aug. 1967, 2 females, K. Stephan, manure (JAWC). UNITED STATES: *Vermont*: WASHINGTON CO., Barre, 7 July 1961, Wagner and Suter, 7 males, 3 females, cow manure mixed with sawdust (JAWC). *Illinois*: COOK CO., Skokie, Peebles Stable, Suter, Wagner, Reichle, W. Blinn, 21 Apr. 1960, 1 male, 1 female; 26 Apr. 1960, 2 males, 1 female; 17 May 1960, 11 males, 5 females; 31 Mar. 1961, 2 females; 20 July 1964, Wagner, 15 males, 10 females; 8 Aug. 1964, Wagner, 11 males, 10 females, all in mixed wood chips-horse manure at composted edge of mound (JAWC); DUPAGE CO., Wayne, 28 Dec. 1952, J. Camin, 3 males, 1 female (OP). *Wisconsin*: ADAMS CO., Friendship, Parklan, 3 Nov. 1961, Suter, 5 males, 5 females; 10 Apr. 1961, Suter and Wagner, 3 males, 3 females, domestic compost (JAWC, OP). The total number examined was 110 (66 males, 44 females, an unusually high ratio of 1.5 males to 1 female).

HABITAT: Thus far restricted to rich domestic or farm compost

especially that with much fungal mycelia and also yielding Ptiliidae, and manure worms. Pearce reports *signatus* from the nests of *F. rufa* in Britain.

Genus *Pycnoplectus* Casey

Pycnoplectus Casey, 1897, p. 552. Type species, *Pycnoplectus linearis* (LeConte), 1850, p. 104, **new designation**. Casey, 1908, p. 264 (descript. note, new species descript.).

Euplectus (*Pycnoplectus*): Raffray, 1903-04, p. 84; 1908, p. 84; 1911, p. 29 (cat. citations). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 25 (descript.). Park, 1942, p. 26 (descript. note). Blackwelder, 1944, p. 90 (cat. citation). Arnett, 1961, p. 321 (cat. citation). Besuchet, 1974, p. 317.

DISCUSSION: In 1893 Casey indicated a subgroup I of North American *Euplectus* and included *difficilis*, *congener*, *sexualis*, *spinifer*, *linearis*, *hudsonicus*, *interruptus*, "and probably" *longissimus*. In 1897 he named this group as a new genus, *Pycnoplectus*, and described two new species, *tenellus*, and *imperfectus*, but he did not designate a type species. *P. tenellus* is a synonym of *congener*, and *imperfectus* is represented by a female type lacking good specific characters, and a *nomen dubium*. I now designate as type species, *Pycnoplectus linearis* (LeConte), 1850. This species clearly exemplifies the characteristics of the genus, which is distinguished by large pubescent vertexal foveae, lack of anterior prosternal foveae (a condition which Park, 1942, p. 25, considers advanced), and males with greatly modified intersegmental membranes between the fourth and fifth sternites, as well as a heavily sclerotized accessory phallus in the aedeagus. The robust form separates the genus to a familiar eye, and it should be included in modern pselaphid taxa.

DESCRIPTION: Body form robust, less parallel and not as depressed as *Euplectus*. Size from 1.3 mm to 2.0 mm in large species such as *P. parki*. Color pale yellow to red-brown.

Head: Trapezoidal, vertex convex with two large pubescent foveae which join frontal impression by sulci, which usually assumes shape of V or Y with short stem nearly crossing frontal roll at center; eyes prominent. Ventral surface with short, subappressed anteriorly directed setae. Mandibles with spinoid seta on external face (reduced in females) (figs. 6-7); labrum variable, concave in *linearis*, medially pointed in *congener*. Antennae as described for *Euplectus* (fig. 12).

Thorax: Pronotal disk with longitudinal impression, antebasal lateral foveae deep, pubescent, joined to glabrous median depression by arcuate sulci; lateral prosternal foveae pubescent, near coxa, an-

terior prosternal foveae (APF) absent. Elytra as described for *Euplectus*.

Legs: Presence or lack of metatrochantal process divides genus into two groups; mesocoxae, or metatrochanters may bear short spines; femur inflated in males; protibia of *P. cedioides* with exceptionally stout spine (fig. 41a); tarsi three segmented with single claw.

Abdomen: Stout, narrower than elytra, five visible tergites and one hypotergite covered by elytra, presumed stridulatory apparatus present (fig. 15); first and second tergites with basal carinae usually quite strong, foveate at base with medial basal depression densely pubescent; six sternites in females, seven in males, sternites four to six of males modified: Median basal fossa in fifth adjacent to projection from fourth-fifth intersegmental membrane, membrane usually with additional lateral spines or tubercles; sixth sternite usually with medial impression but lacking prominent papilliform sensilla; seventh sternite convex with "carina" arcuate to right.

Aedeagus: Apical process trilobed, (genus may be divided into two groups by form of ventral lobe), ventral lobe spatulate (figs. 59–62), or upturned strongly clubbed, some with spine (figs. 45–49); phallus similar to *Euplectus*, but with accessory phallus heavily sclerotized and usually bifid (figs. 16–17). Schuster and Grigarick (1962, p. 1) report a low frequency of exact mirror images in aedeagi of western *Rhexidius* Casey of the same species. I can report one occurrence of mirror image reversal for *Pycnopectus difficilis* (LeConte).

KEY TO THE SPECIES OF PYCNOPECTUS MALES OF UNITED STATES AND CANADA

1. Metatrochanter with small laminoid process on ventral face; ventral aedeagal lobe spatulate *congener* group 8
 Metatrochanter smooth or carinate, but never with blunt, laminoid process; ventral aedeagal lobe clubbed 2
2. Posterior margin of fourth sternite or fourth-fifth intersegmental membrane with lateral tubercles, not spinoid, but rounded, large or minute, or if abdominal sternites strongly contracted, tubercles may be hidden beneath fourth sternite
 *linearis* group 3
 Posterior margin of fourth sternite with lateral spines or spinoid tubercles *sexualis* group 6
3. Protibia with strong stout spine on external face, about two-fifths of tibial length from base (fig. 41a); aedeagus as illustrated (fig. 48) *cedioides*, new species
 Protibia simple, not spined; aedeagus not as illustrated 4
4. Posterior margin of fifth sternite fossa medially deeply and sharply

- divided by triangular notch, separating margin into two oblique, transverse, laminoid tubercles (fig. 44); aedeagus with ventral lobe produced into strong, flat arcuate process (fig. 49) *parki*, new species
- Posterior margin of fifth sternite fossa arcuate or trisinuate; ventral aedeagal lobe otherwise 5
5. Posterior margin of fifth sternite fossa with median pyramidal, truncate tumulus (fig. 40); ventral lobe of aedeagus with short dextral spine (figs. 45 and 46) *linearis* (LeConte)
- Posterior margin of fifth sternite fossa with single arcuation (if segments strongly contracted) or trisinuate, never with pyramidal tumulus (figs. 42 and 43); ventral aedeagal lobe never spined (fig. 47) *interruptus* (LeConte)
6. Lateral spines from margin of fourth sternite completely sclerotized, long, extending across fifth sternite (figs. 50 and 52) ... 7
- Lateral spines part of fourth-fifth intersternal membrane, broad and tubercular at base; mesad to spines an opaque, white membranous lobe (fig. 54); aedeagus as illustrated (fig. 55) *infossus* (Raffray)
7. Body length 1.2 to 1.4 mm; fourth sternite spine sulcate, curving inward slightly at tips, not branched nor twisted (fig. 52); aedeagal accessory phallus bifid with right ramus recurved, left ramus lanceolate (fig. 53) *spinifer* (Casey)
- Body length 1.6 mm; fourth sternite spine variable: Laminate and twisted to end and/or with small black acute thumblike spine (fig. 50); aedeagal accessory phallus bifid with right ramus lanceolate, left ramus curved resembling birds head (fig. 51) *sexualis* (Casey)
8. Mesocoxae and mesotrochanters lacking mesoventral spine; fossa at base of fifth sternite in median third with sharply arcuate, suborbicular, upturned apical margin (fig. 57); aedeagal accessory phallus bifid, both rami strong and straight, mesial ramus slightly longer (fig. 61) *longipennis* (Casey)
- Mesocoxae or mesotrochanters with small, but distinct ventral spine, fifth sternite and aedeagus not as described 9
9. Mesocoxae spined; mesotrochanters not spined; fossa of fifth sternite with trisinuate apical margin (fig. 56); aedeagus with accessory phallus simple, not bifid (fig. 59) ... *congener* (Casey)
- Mesocoxae not spined; mesotrochanters with small ventral spine; aedeagus with accessory phallus bifid 10
10. Fossa of fifth sternite with sinuate posterior margin (fig. 56 as in *congener*); accessory phallus with left ramus broadly arcuate, sickle shaped (fig. 60) *falcatus*, new species
- Fossa of fifth sternite with straight apical margin for median half of width (fig. 58); accessory phallus with short thumblike lateral process (fig. 62) *difficilis* (LeConte)

LINEARIS GROUP

The four species in this group may be distinguished by the following combination of characteristics in males: 1) legs without spines or laminae on coxae and trochanters, 2) fourth-fifth sternite intersegmental membrane with lateral tubercles, but not spines nor tubercles produced to spines, 3) ventral lobe of aedeagus strongly upturned and clubbed, and bifid in all species except *interruptus*.

Pycnoplectus linearis (LeConte), new combination

Euplectus linearis LeConte, 1850, p. 104. Type locality: Louisiana, Type male MCZC no. 6188. Subsequent references: Casey, 1884, p. 106. Brendel and Wickham, 1890, p. 68 (descript., fig. 107, distr. data). Raffray, 1911, p. 34 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 32 (descript., key ref.).

Euplectus impressiceps Casey, 1908, p. 265. Type locality: Westmoreland Co., Pennsylvania, Type deposition unknown. Subsequent references: Raffray, 1911, p. 34 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 34 (descript., key ref.). **New synonym.**

DISCUSSION: This has been the most frequently collected species of the genus in the southeast. LeConte's description of *linearis* is based on head, pronotal, and other generic features with no mention of male venter characteristics. Although the type of *impressiceps* could not be located in any of the major collections I examined, Casey's description of the male venter is identical to the Type of *linearis* at the Museum of Comparative Zoology. I have collected numerous specimens of *linearis* in Westmoreland County, Pennsylvania which agree completely with the description of *impressiceps*, and it is undoubtedly a synonym of *linearis*.

MEASUREMENTS OF TYPE MALE: Head .264 mm long $\times$.369 mm wide, pronotum .330 mm long $\times$.389 mm wide, elytra .475 mm long $\times$.492 mm wide, abdomen .528 mm long $\times$.475 mm wide, antenna .528 mm long, tergite ratio 1-1-1-2-1, sternite ratio 1-1-1-.9-.6-.8-1.5, basal abdominal carinae maximum separation .140 mm.

DESCRIPTION: Body pubescence short, aciculate, evenly spaced; longer guard setae along margins; color even red-brown.

Head: Trapezoidal, surface finely and sparsely punctulate; vertex convex with two pubescent foveae on line through base of eyes; frontal sulcus in form of rounded Y, stem barely crossing frontal margin at center, and arms arcing to foveae; eyes large, with about 40 facets; first segment of antenna cylindrical, as long as 2 and 3 combined, 9 transverse, as long as 8, 10 twice as large as 9, 11 wider than 10 as long as 8 through 10 combined, with two sensory excavations; gula

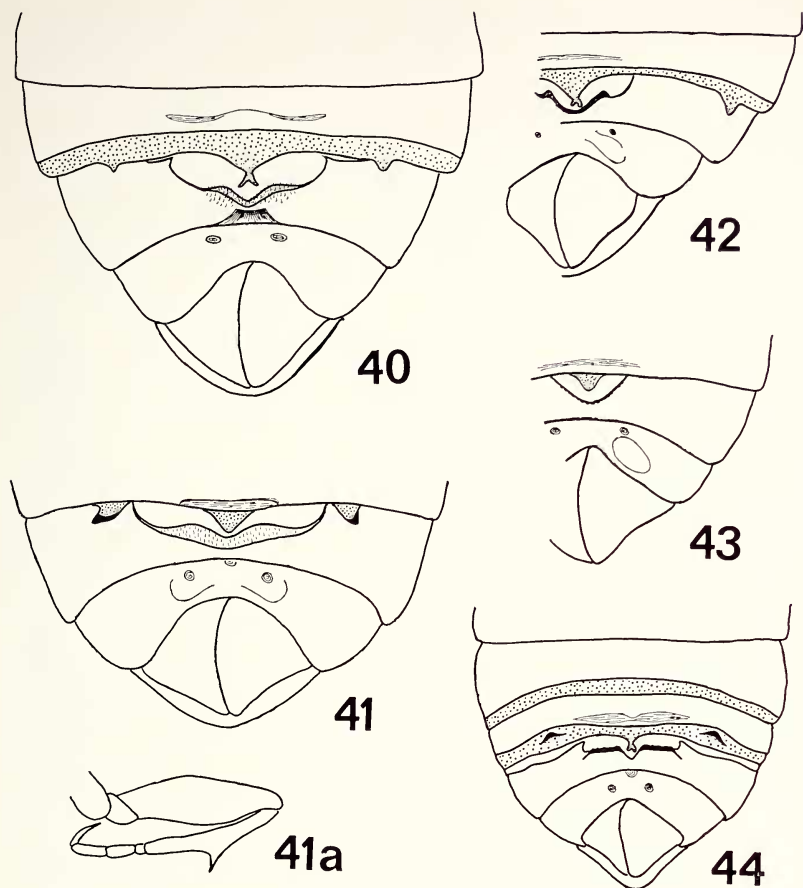
convex, lightly punctate with several forward directed aciculate setae; mandibles with stout spinoid seta on each external angle.

Thorax: Pronotum cordiform, widest just before middle, discal sulcus elongate, feebly connected with antebasal sulcus which connects strongly with lateral pubescent foveae; prosternum convex, not carinate, sparsely punctulate, anterior prosternal foveae (APF) obsolete, indicated only by tiny impressions, lateral prosternal foveae (LPF) large and densely pubescent; metasternum longitudinally sulcate; elytra broadest part of body, elytron with four antebasal foveae and pubescent subhumeral fovea; sutural stria and subhumeral stria entire, discal stria feeble in first half of length; legs simple, mesotrochanters carinoid.

Abdomen: First two tergites with nearly entire, slightly divergent basal carinae; area between carinae basally pubescent. Male venter: Sternites 1 through 3 simple; fourth sternite transversely tumuloid (in some carinate), tumulus usually medially depressed; intersegmental membrane between fourth and fifth with median triangular tubercle, and small tubercles in each lateral third; fifth sternite with deep fossa in basal median third which contains median tubercle of fourth, posterior margin of fossa upturned, carinoid, and sinuate; fifth sternite with truncate pyramidal tumor in apical center which joins margin of fossa; sixth sternite impressed medially with two small rounded tumuli separated by one-fifth segmental width; seventh sternite convex, carina arcuate to right (fig. 40).

Aedeagus: With simple lanceolate accessory phallus; ventral lobe upturned and clubbed, with lanceolate spine projecting from distal right side and paralleling main branch (in some quite reduced or three-fourths as long as clubbed ramus) (figs. 45, 46).

MATERIAL EXAMINED: CANADA: *Ontario:* ESSEX CO., Tilbury, 5 Sept. 1967, K. Stephan, 2 males, 1 female, sifting (JAWC). UNITED STATES: *Louisiana:* Type male 1, 1 male, 2 females paratypes, collected by Schaum (type labeled with a red-brown tag which was LeConte's key for the Gulf States), LeConte collection (MCZC). *New York:* NIAGARA CO., Olcott, 15 Aug. 1922, H. Dietrich, 1 male (OP). *New Jersey:* GLOUCESTER CO., Woodbury, 1 male (OSUC). *Pennsylvania:* 19 Aug. 1896, 1 male, C. A. Schaeffer collection (OP); BERKS CO., Highs Hill, 14 Aug. 1951, D. G. Kissinger, 1 male (OP), Mt. Penn, 7 July 1951, 1 male, under bark (OP); PHILADELPHIA CO., 1 male, 3 females; Frankfort, 1 male, 3 females (OSUC); WESTMORELAND CO., Rector, Linn Run, 24 July 1959, Wagner and Suter, 1 male, log mold (JAWC), Seward, 24 and 28 July 1959, Wagner and Suter, 9 males, 4 females; 13 males, 12 females; 5 males, 5 females, all in sawdust and under boards in sawdust (JAWC), Latrobe, St. Vincent,



FIGS. 40-44. *linearis* group of *Pycnoplectus*, male venters. 40. *Pycnoplectus linearis* (LeConte), sternites 4-7. 41. *Pycnoplectus cediosus*, new species, sternites 4-7. 41a. Right proleg. 42. *Pycnoplectus interruptus* (LeConte), sternites 4-7 expanded. 43. *P. interruptus* (LeConte), sternites 4-7 contracted. 44. *Pycnoplectus parki*, new species, sternites 3-7.

28 July 1959, Wagner, 1 male, 2 females, beech TH, 1 male, under bark (JAWC), 1 male, 2 females, Fall collection (MCZC). *Maryland*: BALTIMORE CO., Baltimore, 26 July 1959, Suter, 2 males, 2 females, sawdust in oak tree crotch (JAWC); HOWARD CO., Woodstock, 26 July 1959, Wagner and Suter, 3 males, 2 females, under boards in sawdust, 5 males, 4 females, sawdust (JAWC); MONTGOMERY CO.,

Glen Echo, 6 June 1964, Suter, 1 male, under bark (JAWC). *Washington, D.C.*: 2 female "paratypes" (MCZC), United States National Arboretum, 27 July 1959, Wagner and Suter, 1 male, under bark (JAWC). *Georgia*: FULTON CO., Atlanta, 3 Apr. 1934, S. T. Park, 1 male (OP); GLYNN CO., Jekyll Island, 28 May 1959, S. Auerbach, 1 male, 2 females, log mold (JAWC); TERRELL CO., Dawson, 18 June 1959, Suter, 1 male, live oak TCH (OP). *Florida*: 1 male, (ICCM); VOLUSIA CO., Enterprise, 2 mi. SW, 31 July 1965, Suter, 9 males, 2 females, oak log mold with 1 male *P. spinifer* (JAWC). *Kentucky*: POWELL CO., nr. Sky Bridge Valley of Red River, 12 June 1947, E. Williams, 1 male (OP). *Ohio*: Psota collection ex. Wickham collection, 1 male (FMNH); HAMILTON CO., Cincinnati, 1 male, 1 female, Fall collection (MCZC), 30 Apr. 1902, 1 male (OP). *Indiana*: MONTGOMERY CO., Waveland, Shades State Park, 7 Sept. 1950, Park, 2 males (OP); PORTER CO., Ogden Dunes, 26 Oct. 1946, Park, 1 male, floor litter (OP). *Illinois*: 1 male, Bolter collection (INHS); CHAMPAIGN CO., Urbana, Trelease Woods, 1 male, TH; 1 male, 3 females, under bark; Brownfield Woods, 1 male, rotten polypore fungus; 1 male, leaf mold (INHS), 3.5 mi. NE Mahomet, Hart Memorial Woods, M. W. Sanderson, 1966, 16 Apr., 1 female, under bark; 15 May, 1 male, under bark; 30 May, 1 male, 3 females, under bark oak log; 30–31 May, 2 males, black light trap; 3–4 June, 5 females, under bark oak log; 17–18 June, 1 male, black light (JAWC); JACKSON CO., Makanda, 1 male, 1 female, log mold (INHS); LASALLE CO., Starved Rock State Park, 2 males, log mold (OP); MASON CO., Havana, 1 male, log mold (INHS); PIATT CO., White Heath, 1 male, log mold (INHS); UNION CO., Wolf Lake, Pine Hills Ecological Area, 29 Aug. 1959, Wagner and Suter, 3 males, 1 female, beech TH (JAWC); VERMILION CO., Danville, 2 males, 1 female, stump mold (INHS); WILL CO., Monee, Raccoon Grove, 18 Dec. 1959, Suter, 2 males, 4 females, maple TH, 6 May 1961, Suter and Reichle, 1 male oak BTH (JAWC). *Michigan*: BERRIEN CO., Lakeside, Warren Woods, 7 May 1949, Park, 1 male, 18 Apr. 1942, J. B. Calhoun, 1 female, 8 Nov. 1952, S. Auerbach, 1 male, (OP). *Oklahoma*: CLEVELAND CO., Norman, Oliver Woods, 10 July 1968, Suter, 1 male, dead oak buttress debris, 30 June 1965, Suter, 1 female, stump buttress debris (JAWC). *Texas*: COLORADO CO., Columbus, 23 July 1968, Suter, 1 male, 1 female, under bark cottonwood (JAWC). The total number examined was 173 (102 males, 71 females).

HABITAT: *Pycnoplectus linearis* has been collected with equal frequency in log mold and from under bark; sawdust and tree holes have yielded some good series; the four collections at black light from

Hart Woods are from a trapping program run for an entire year, this is the only record of collection at light for the genus.

***Pycnopectus interruptus* (LeConte), new combination**

Euplectus interruptus LeConte, 1850, p. 105. Type locality: Athens, Clarke Co., Georgia, Type male MCZC no. 6190. Subsequent references: Casey, 1884, p. 107. Brendel and Wickham, 1890, p. 64 (descript., key ref., fig. 108). Raffray, 1911, p. 34 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 33 (descript., key ref.).

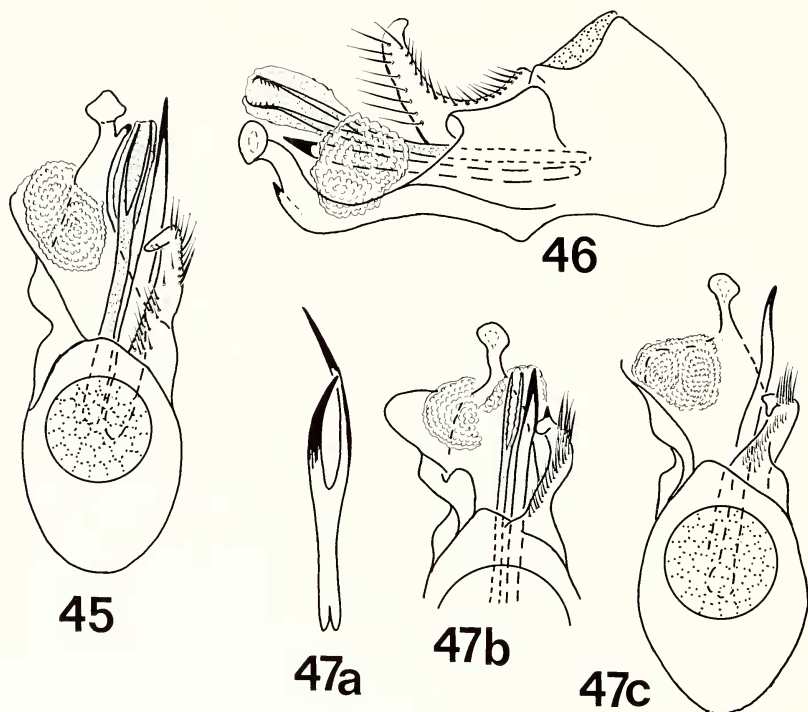
Euplectus hudsonicus Casey, 1893, p. 455. Type locality: Brooklyn, Kings Co., New York, Type male USNM no. 38617. Subsequent references: Raffray, 1911, p. 34 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 32 (descript., key ref.). Park et al., 1950, p. 39 (ecology). **New synonym.**

DISCUSSION: This species is complex and its discrimination is not wholly satisfactory. Sufficient material is not now available for detailed analysis. If the abdomen has contracted due to shrinkage in drying, the description of the male venter may not apply. Instead, the fourth-fifth intersegmental membrane may be entirely withdrawn so that the tubercles do not show. The fossa of the fifth sternite may appear quite small, with a simple, flat arcuate margin (fig. 43). The type male of *hudsonicus* has the abdomen strongly contracted so that the fourth-fifth membrane is completely withdrawn. It is understandable that Casey might describe this species as distinct, but on close comparison with *interruptus* it is conspecific.

MEASUREMENTS OF TYPE MALE: Head .264 mm long $\times$.369 mm wide, pronotum .334 mm long $\times$.422 mm wide, elytra .510 mm long $\times$.528 mm wide, abdomen .492 mm long $\times$.528 mm wide, antenna .422 mm long, tergite ratio 1-1-1-2-1, sternite ratio 1-1-1-1-.3-.4-1.4, basal abdominal carinae maximum separation .140 mm.

DESCRIPTION: Preceding description for *linearis* applies to *interruptus* except for characters noted here: Body less robust, features generally more subdued. Male venter: Fourth sternite transversely tumid in median fourth (tumulus obsolete in some populations, nearly carinoid in others); membrane between fourth and fifth sternites with median triangular tubercle, as in *linearis*, but lateral tubercles more widely separated, in lateral fourth of width; fifth sternite with median basal fossa with trilobate, flat posterior margin; sixth sternite with deep, subreniform impression and two small basal tumuli (fig. 42 expanded, fig. 43 contracted).

Aedeagus: Ventral lobe upturned and clubbed, but always simple without trace of spine or any branching; accessory phallus bifid, rami



FIGS. 45-47. Figs. 45-46. *Pycnoplectus linearis* (LeConte), aedeagus. 45. Dorsal (.246 mm long). 46. Left lateral. 47. *Pycnoplectus interruptus* (LeConte), aedeagus. 47a. Accessory phallus. 47b-c. Variations in right lateral lobe.

long and slightly curved (fig. 47a); right lateral lobe in some with small terminal process (fig. 47b).

MATERIAL EXAMINED: CANADA: Ontario: ESSEX CO., Wheatley, 10 June 1967, K. Stephan, 1 male, sifting (JAWC). UNITED STATES: Georgia: CLARKE CO., Athens, Type male 1 (MCZC). Alabama: BLOUNT CO., Cleveland, 7 mi. S., 28 June 1967, Peck and Fiske, 1 male, stump and log litter (JAWC). New York: KINGS CO., Brooklyn, H. H. Smith, 1 male, Type of *Euplectus hudsonicus* (USNM no. 38617). Washington, D.C.: 3 males (ICCM). Pennsylvania: WESTMORELAND CO., Rector, Linn Run, 24 July 1959, Wagner and Suter, 1 male, 1 female, log mold (JAWC). Michigan: BERRIEN CO., Lakeside, 30 July 1949, S. Auerbach, 4 males (OP); LIVINGSTON CO., E. S. George Reserve, 4 May 1960, Suter, 1 male, oak TH, 2 males, stump hole (OP). Ohio: HAMILTON CO., Cincinnati, 7 males (CMNH).

Indiana: LAPORTE CO., Smith, 18 Aug. 1934, O. Park, 1 male (OP). *Illinois*: CHAMPAIGN CO., Urbana, 14 Apr. 1934, O. Park, 2 males, 1 female (OP); Brownfield Woods, 1 male, log mold (INHS); COOK CO., Orland Park, 2 Apr. 1959, Suter, 1 male, 1 female, oak TH (JAWC), Palos Park, Maple Lake, 23 Apr. 1960, Wagner, 1 male, oak TH (JAWC), Des Plaines, Carle Woods, 1 June 1960, Suter, 1 male, linden TH (JAWC); SANGAMON CO., Sherman, 1 male (INHS); WILL CO., Monee, Raccoon Grove, 18 Dec. 1959, Suter, 3 males, 4 females, maple TH (OP). *Wisconsin*: MONROE CO., Camp McCoy, 12 July 1959, Suter, 1 male (JAWC). *Minnesota*: CROW WING CO., Pequot Lakes, 2 males (OP). *Iowa*: STORY CO., Ames, 8 Nov. 1964, W. Craig, 1 male (JAWC). The total number examined was 44 (37 males, 7 females).

HABITAT: Tree holes have yielded a few more specimens than log mold.

***Pycnoplectus cediosus*, new species**

Type locality: Cincinnati, Hamilton Co., Ohio. Holotype male Charles Dury collection CMNH.

DISCUSSION: This species is represented by the holotype male from Ohio, originally labeled "near *linearis*," and a second male collected 55 years later by Walter Suter in Kentucky. Indeed, the most remarkable departure from *linearis* is the spine of the protibia, which easily separates it from other species in the genus.

MEASUREMENTS OF HOLOTYPE MALE: Head .235 mm long $\times$.365 mm wide, pronotum .316 mm long $\times$.404 mm wide, elytra .475 mm long $\times$.528 mm wide, abdomen .528 mm long $\times$.490 mm wide, antenna .651 mm long, basal abdominal carinae maximum separation: First—.158 mm, second—.140 mm, total length 1.5 mm.

DESCRIPTION: Body rather stout, uniform red-brown, antennae and legs similar; pubescence moderate in length and number, some longer guard setae.

Head: Trapezoidal, widest through eyes; two pubescent vertexal foveae on line through posterior third of eyes; strong, glabrous U-shaped sulcus connecting foveae; vertex between foveae convex, impunctate; antennae long, first segment as long as 9 and 10 united; mouthparts as described in *linearis*.

Thorax: Pronotum widest just before middle, discal sulcus strong, elongate to antebasal impression which joins lateral pubescent foveae by sulci; margins slightly crenate in basal third; anterior prosternal foveae obsolete, lateral prosternal foveae pubescent; prolegs unique: Protibia with strong acute spine on external face two-fifths tibial length from base (fig. 41a); other legs simple. Elytra as described in *linearis*.

Abdomen: Tergites as described in *linearis*. Male venter: Fourth sternite tumid in median third; fourth-fifth intersegmental membrane with tubercle in each lateral third, median tubercle extending into fossa of fifth; fifth sternite fossa in basal third with complex triarcuate margin, just posterior to margin a parallel secondary margin; sixth sternite with three small median tumuli in shallow depression; seventh sternite with carina arcuate to right (fig. 41).

Aedeagus: Ventral lobe bifid, left ramus upturned and clubbed, right ramus lanceolate and curved; accessory phallus simple and bifid (fig. 48).

MATERIAL EXAMINED: *Ohio*: HAMILTON CO., Cincinnati, 15 May 1906, 1 male, Holotype, C. Dury collection (CMNH). *Kentucky*: EDMONSON CO., Mammoth Cave National Park, 24 Apr. 1961, Suter, 1 male, log mold (JAWC). Only these 2 specimens are known.

***Pycnoplectus parki*, new species**

Type locality: Quincy, Adams Co., Illinois. Holotype male INHS.

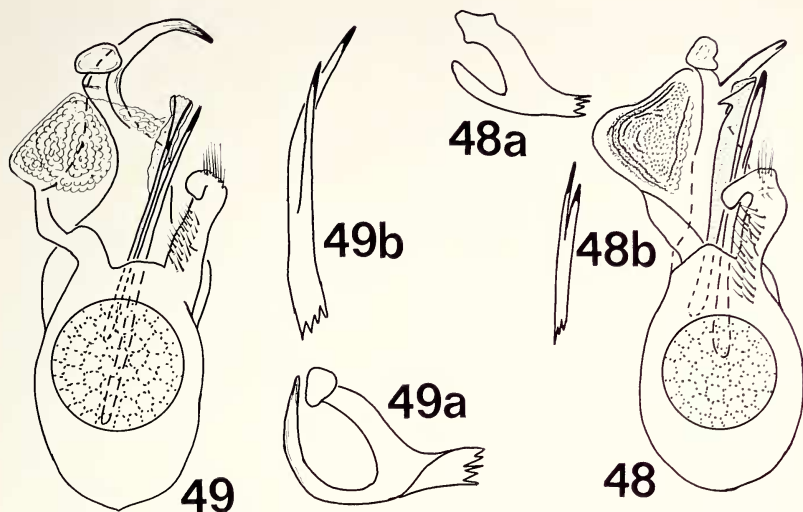
DISCUSSION: This new species has the general form and structural characteristics of *linearis* so that no detailed morphological description is needed. It differs from all other species in the genus by the secondary features of the male venter, its relatively larger size, and the ventral aedeagal lobe. It is a pleasure to name this new species for the late American authority on Pselaphidae, Orlando Park.

MEASUREMENTS OF HOLOTYPE MALE: Head .310 mm long $\times$.404 mm wide, pronotum .422 mm long $\times$.460 mm wide, elytra .580 mm long $\times$.616 mm wide, abdomen .729 mm long $\times$.580 mm wide, antenna .616 mm long $\times$.088 mm wide, tergite ratio (1)-2-2-2-2.2-1, sternite ratio 1-1-1-.8-.5-.6-1.4, basal abdominal carinae maximum separation .176 mm, total length 2 mm.

DESCRIPTION: Punctuation sparse but coarse, pubescence long, sparse, golden and semiappressed; color uniform red-brown.

Head: Vertexal foveae large, densely pubescent, connected by entire deep glabrous U-shaped sulcus; labrum with apical margin strongly convex with median subacute point; maxillary palpi with distal segment unusual: Twice as wide as third segment with short thick palpal cone at apex, dorsal surface swollen at apical three-fourths into small tubercular area; antennae as described in *linearis*.

Thorax: Pronotum with median longitudinal impression of disk very long, arising abruptly at apical three-fourths and continuing as deep sulcoid impression to enter transverse antebasal sulcus; elytra as described in *linearis*; legs rather short heavy, tibia, and femora thick,



FIGS. 48–49. Figs. 48. *Pycnoplectus cediosus*, new species, aedeagus. 48a. Lateral view of ventral lobe. 48b. Accessory phallus. Fig. 49. *Pycnoplectus parki*, new species, aedeagus. 49a. Lateral view of ventral lobe. 49b. Accessory phallus.

mesofemora slightly heavier than others; coxae and trochanters lacking spines or lamellae.

Abdomen: First two visible tergites with basal carinae. Male venter: Fourth sternite with posterior margin tumuloid in median third, tumulus with shallow median impression; fourth-fifth intersegmental membrane with tubercle at center of lateral third, very transversely triangular wedge, three times wider than long; fifth sternite with deep fossa in median third with medial bisecting tubercle as described in *linearis*, posterior margin of fossa diagnostic: Deeply and sharply incised by triangular notch which separates margin into right and left oblique laminoid tubercle; sixth sternite with three small tumuli in triangular pattern, one at center of base and right and left tumulus in center; seventh sternite with carina arcuate to right (fig. 44).

Aedeagus: Ventral lobe bifid, both rami strongly upturned, main ramus arises first and terminates in club, second is lanceolate and curved strongly to left; accessory phallus bifid, ventral ramus slightly longer (fig. 49).

MATERIAL EXAMINED: *Illinois:* ADAMS CO., Quincy, nr. Coe's Spring, 28 Apr. 1944, Rev. E. Long, 1 male, Holotype (INHS). *Ohio:*

HAMILTON CO., Cincinnati, Dury, 28 Oct. 1909, 1 male; 6 May 1919, 1 male; 24 Apr. 1921, 2 males; 13 Nov. 1909, 1 male, 1 female (CMNH). *North Carolina*: MACON CO., Highlands, 2.5 mi. NW, Van Hook Glade, 1-2 Sept. 1949, Dybas, 1 male (JAWC). The total number examined was 7 (6 males, 1 female); none had habitat data.

SEXUALIS GROUP

The three species here are most similar to those of the *linearis* group in general appearance and lack of leg armature. They are separated by the remarkable spines or spinoid tubercles of the male venter; these features are among the most extreme secondary sex characters for any euplectines. *P. spinifer* and *sexualis* are more closely related; the broad spinoid tubercle of *infossus* suggests the origin of the spines in the other two species.

***Pycnoplectus sexualis* (Casey), new combination**

Euplectus sexualis Casey, 1884, p. 103. Type locality: South Carolina. Type male USNM no. 38614. Subsequent references: Brendel and Wickham, 1890, p. 63 (descript., key ref.). Raffray, 1911, p. 34 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 31 (descript., key ref.).

DISCUSSION: *P. sexualis* is a larger species than its closest relative *spinifer*. It is most easily separated by the more elaborate spines of the male venter. These may appear broadly sulcate, to laminate and twisted at the end, some have a small additional spine which makes the whole spine resemble a miniature hand with the thumb pointed in.

MEASUREMENTS OF TYPE MALE: Head .281 mm long $\times$.389 mm wide, pronotum .334 mm long $\times$.389 mm wide, elytra .582 mm long $\times$.563 mm wide, abdomen .530 mm long $\times$.530 mm wide, antenna .530 mm long $\times$.10 mm wide, tergite ratio 1-1-1-2-.8, sternite ratio ?-1-1-.8-2-.8-1.4, basal abdominal carinae maximum separation .176 mm, total length 1.6 mm.

DESCRIPTION: Form as described in *linearis*, size large. Head quadrate, vertex convex with pubescent foveae; margins lateral to U-shaped frontal sulcus, rugose in some, normal in others. Pronotal disk convex with median elongate sulciform impression; lateral foveae deep, antebasal sulcus strong; legs and elytra as described in *linearis*. Abdominal carinae on first two tergites strong, entire, slightly incurved at tips. Male venter: Similar to *spinifer*, sternites 1 through 3 simple; fourth sternite broadly and feebly emarginate in median third with posterior angles roundly produced (margin nearly normal, unmodified in some populations), from under margin in lateral third a strong

diverging variable spine extends over fifth segment: Spine sulcate in distal half, some laminate and twisted to end, some with small black acute thumblike spine at widest point (never simple and evenly curved as in *spinifer*); fourth-fifth intersegmental membrane with median tubercle; fifth sternite with deep fossa in median third with darkened tumid margin divided by median notch; sixth sternite with subreniform impression; seventh sternite convex, carina arcuate to right (fig. 50).

Aedeagus: Ventral lobe upturned and clubbed; accessory phallus bifurcate, left ramus curved resembling birds head (fig. 51).

MATERIAL EXAMINED: *South Carolina*: 1 male Type (USNM). *Maryland*: MONTGOMERY CO., Takoma Park, 21 Oct. 1951, Kissinger, 1 male (OP). *Washington, D.C.*: 3 Sept. 1964, Suter, 1 male, 1 female, forest floor (JAWC). *Florida*: BAKER CO., Macclenny, 5 mi. N., 18 Aug. 1965, Suter, 1 male, tree fork bush (JAWC); LEVY CO., Bronson, 27 June 1965, Suter, 1 male, sawdust (JAWC). *Alabama*: MOBILE CO., Mobile, 10 mi. S., W. shore of Mobile Bay, 17-20 Aug. 1949, Dybas, 1 male, 2 females, dusk flight (FMNH). *Mississippi*: JACKSON CO., Ocean Springs, 15 Oct. 1953, Dybas, 1 male (OP). The total number examined was 10 (7 males, 3 females).

HABITAT: No generalizations can be drawn from the seven collections. It is of interest that three specimens were taken by use of an air plankton net at dusk by Henry Dybas. This is an unique record for the genus.

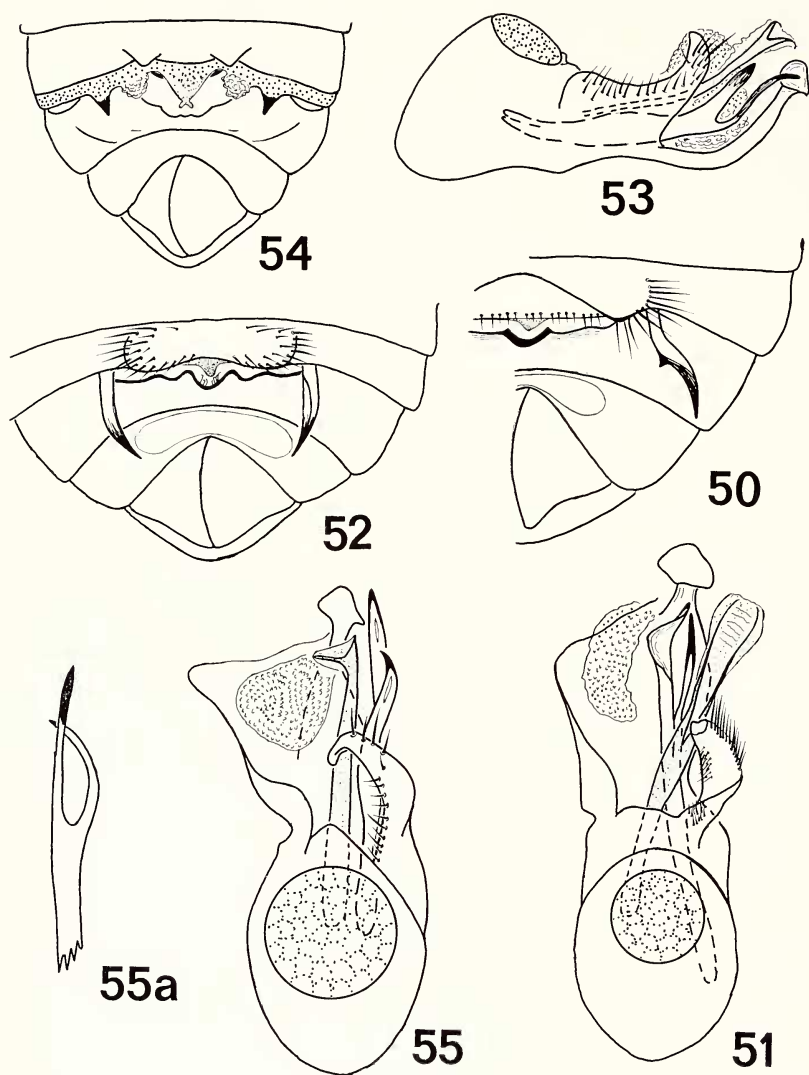
***Pycnoplectus spinifer* (Casey), new combination**

Euplectus spinifer Casey, 1884, p. 104. Type locality: Columbus, Colorado Co., Texas. Type male USNM no. 38615. Subsequent references: Brendel and Wickham, 1890, p. 62 (descript., key ref., figs. 111, 117). Raffray, 1911, p. 34 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 31 (descript., key ref.).

DISCUSSION: *P. spinifer* is a smaller species than its closest relative *sexualis*, and it seems to be much more abundant. It may be separated by the nature of the aedeagus, and the relatively more simple spines on the male venter.

MEASUREMENTS OF TYPE MALE: Head .228 mm long $\times$.299 mm wide, pronotum .264 mm long $\times$.320 mm wide, elytra .412 mm long $\times$.440 mm wide, abdomen .475 mm long $\times$.404 mm wide, antenna .422 mm long $\times$.088 mm wide, tergite ratio 1-1-1-1.6-1, sternite ratio 1-1-1-.6-.5-.2-1.5, basal abdominal carinae maximum separation .123 mm, total length (range of several specimens) 1.2 to 1.4 mm.

DESCRIPTION: Form as described in *linearis*. Head quadrate, vertex convex with pubescent foveae; margins laterad to frontal sulcus



FIGS. 50-55. *sexualis* group of *Pycnoplectus*. Figs. 50-51. *Pycnoplectus sexualis* (Casey). 50. Sternites 4-7 of male. 51. Aedeagus (.281 mm long). Figs. 52-53. *Pycnoplectus spinifer* (Casey). 52. Sternites 4-7 of male. 53. Aedeagus, right lateral (.215 mm long). Figs. 54-55. *Pycnoplectus infossus* (Raffray). 54. Sternites 4-7 of male. 55. Aedeagus (.264 mm long). 55a. Accessory phallus.

not rugose. Pronotal disk with small feebly elongate impression; lateral foveae deep; legs and elytra as described in *linearis*. Abdominal carinae on first two tergites widely separated, nearly entire, slightly incurved at tips. Male venter: Similar to *sexualis*, sternite 1 through 3 simple; fourth sternite tumid in median third, margins of tumulus variable: Weak or obsolete to strong with sublaminar margin, in lateral third from under fourth sternite a long unbranched movable spine with shallow mesial sulcus in distal half, tip acute, sometimes blackened; spines pass over fifth and part of sixth sternites; fourth-fifth intersegmental membrane with median tubercle as described in *linearis*; fifth sternite with deep basal fossa in median third, margin of fossa trilobate and darkened, median lobe with several anterior pointing recurved setae; sixth sternite with shallow subreniform impression; seventh sternite with carina arcuate to right (fig. 52).

Aedeagus: Length .215 mm, form similar to *sexualis*, but accessory phallus with right ramus strongly recurved and left ramus broadly lanceolate (fig. 53).

MATERIAL EXAMINED: *Texas*: COLORADO CO., Columbus, 1 male Type (USNM). *Maryland*: BALTIMORE CO., Baltimore, 1 male (OP). *Florida*: ALACHUA CO., Gainesville, 1 Aug. 1956, Suter, 1 male, litter at log (JAWC); HIGHLANDS CO., Highlands Hammock State Park, 24 Aug. 1965, Suter, 2 males, subcortical log with *Passalus*, 1 male, buttress debris at log; 26 Aug. 1965, Suter, 1 male, 1 female, litter at log; 5 Apr. 1966, Wagner, 3 males, 4 females, floor mold; 6 Apr. 1966, Suter, 1 male, log mold (JAWC), Parker Islands, Lake Placid, 4 mi. E., 19 June 1955, Dybas, 1 male; 26 Aug. 1965, Suter, 1 male, 1 female, litter at log (JAWC); LEON CO., Chaires, 14 Aug. 1965, Suter, 1 male, sawdust (JAWC); COLUMBIA CO., Lake City, 7 mi. SE, 28 Aug. 1949, Dybas, 1 male, 1 female, under pine bark (FMNH); DIXIE CO., Old Town, 16 June 1965, Suter, 2 males, gum TH; 2 males, 4 females, palmetto stump (JAWC). *Alabama*: MARSHALL CO., Gunter'sville, nr. Griffith Cave, 19 June 1959, Suter and Wagner, 22 males, 23 females, old sawdust (JAWC). *Mississippi*: JACKSON CO., Ocean Springs, 10 May 1931, H. Dietrich, 1 male (OP); GEORGE CO., Lucedale, 10 Feb. 1931, Dietrich, 1 male, 3 females (OP). *Louisiana*: 2 males (ICCM); MADISON PR., Tallulah, 2 males, humus, Fall collection (MCZC); JEFFERSON PR., Harahan, nr. New Orleans, 1 male, under bark; 1 male, 1 female (INHS), 2 Dec. 1944, C. L. Remington, 1 male, 1 female, palmetto litter (OP). *Arkansas*: WASHINGTON CO., 2 Mar. 1940, M. W. Sanderson, 2 males (OP). *Tennessee*: MONROE CO., Sweetwater, 7 May 1955, W. J. Cloyd, 1 male, sawdust (OP). *Indiana*: LAPORTE CO., Smith Station, Davis Woods, 15 May 1961, Blinn and Suter, 1 male, stump mold (JAWC). *Illinois*: ALEXANDER

co., Cache, 1 male, 1 female, TH, Olive Branch, 1 male, forest floor litter (INHS). Iowa: JOHNSON CO., Coralville, 17 Apr. 1965, Suter, 1 male, 2 females, under boards on sawdust (JAWC). The total number examined was 100 (58 males, 12 females).

HABITAT: Forest floor litter, log mold and old sawdust seem to be preferred habitats.

***Pycnoplectus infossus* (Raffray), new combination**

Euplectus infossus Raffray, 1903, p. 541. Type locality: Pennsylvania.

Type male Paris. Subsequent references: Raffray, 1911, p. 34 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 32 (descript., key ref.). Park, 1956, p. 63 (descript., fig., distr. rec.).

Euplectus excavatus Bowman, 1934, p. 141. Type locality: Penn-Mar, Franklin Co., Pennsylvania. Type male ICCM. **New synonym.**

DISCUSSION: This species was known only from Raffray's original description until Park redescribed it. It is an uncommon species but easily distinguished by the remarkable features of the male venter. The Type of *excavatus* agrees exactly with the type of *infossus*, which I examined on loan from the Raffray collection, and it is clearly a synonym.

MEASUREMENTS OF TYPE MALE: Head .228 mm long $\times$.334 mm wide, pronotum .299 mm long $\times$.352 mm wide, elytra .457 mm long $\times$.456 mm wide, abdomen .500 mm long $\times$.457 mm wide, antenna .528 mm long, tergite ratio 1-1-1-1.5-1, sternite ratio 1-1-1-1.2-4-.5-2, basal abdominal carinae maximum separation .105 mm, total length 1.46 mm (measurements on other specimens were slightly greater than those of the type male).

DESCRIPTION: Form robust, in general as for *linearis*. Head sparsely punctulate, margins barely subrugose, vertex convex with distant pubescent foveae. Thorax with convex pronotum, disk with small deep oval fovea one-third longer than wide, two-thirds as long as disk. Legs and elytra as described for *linearis*. Male venter: Fourth sternite complex: Posterior margin slightly toothed on each side of median third, below margin on intersegmental membrane a median rounded slightly concave process, on either side of median process an opaque white irregularly shaped lobe from intersegmental membrane, laterad of lobe on membrane a large conical acute spine that projects over fifth sternite; fifth sternite with deep fossa in basal three-fourths; sixth sternite with shallow subreniform impression; seventh sternite convex, carina arcuate to right (fig. 54).

Aedeagus: Ventral lobe clubbed, right lateral lobe strongly arcuate to left; accessory phallus bifid, both rami long, lanceolate, dorsal ramus curved (fig. 55).

MATERIAL EXAMINED: *Pennsylvania*: (WESTMORELAND CO.?), Rev. J. Schmitt, 1 male Type (Paris); FRANKLIN CO., Penn-Mar, 1 male, Type of *E. excavatus* (ICCM). *West Virginia*: RANDOLF CO., Bickle Knob, E. of Elkins, 19 June 1968, S. Peck, 3800 ft., 1 male, log litter (JAWC). *Kentucky*: HARLAN CO., Big Black Mountain, 11 July 1968, S. Peck, 4000 ft., 1 male, stump and log litter, with 1 male *P. longipennis* and 5 *Pycnoplectus* ?sp. females (FMNH). *Tennessee*: SEVIER CO., Smoky Mountains National Park, Cherokee Orchard, 17 Nov. 1953, Dybas and Auerbach, 2000 ft., 1 male, 1 female, maple TH (OP). *Georgia*: UNION CO., Brasstown Bald, 11 Aug. 1963, Steeves and Patrick, 2350 ft., 2 males, sawdust (HS); CLEBURNE CO., Heflin, 7 mi. N., 28 July 1962, R. C. and A. Graves, 1 male, 1 female, sawdust (JAWC), Talladega National Forest, 16 Apr. 1960, Steeves, 1 male, sawdust pile under slabs (HS); JACKSON CO., nr. Horseshoe Cave, 29 Apr. 1961, Steeves, 1 male, tulip TH (HS). The total number examined was 12 (10 males, 2 females).

HABITAT: Two collections each from tree holes and log mold; three from sawdust.

CONGENER GROUP

These species are separated by the presence of small spines or darkened lamina on the mesocoxae or metacoxae, or trochanters. The spatulate ventral lobe of the aedeagus is also a common feature and suggests these four species comprise a natural group.

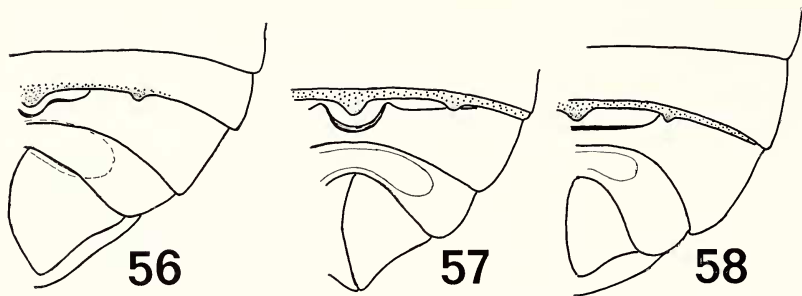
***Pycnoplectus congener* (Casey), new combination**

Euplectus congener Casey, 1884, p. 101. Type locality: Washington, D.C., Type male USNM no. 38613. Subsequent references: Brendel and Wickham, 1890, p. 67 (descript., key ref.). Raffray, 1911, p. 34 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 30 (descript., key ref.).

Pycnoplectus tenellus Casey, 1897, p. 552. Type locality: St. Vincent, Westmoreland Co., Pennsylvania. Type male USNM no. 38619. Subsequent references: Raffray, 1911, p. 34 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 34 (descript., key ref.).

New synonym.

DISCUSSION: *P. congener* is readily distinguished from other *Pycnoplectus* by the laminoid projection on the metatrochanter and the spine on the mesocoxa. Furthermore, it is the only species of the *congener* group with the aedeagal accessory phallus simple, not bifid as in the others. It is the most abundant species in the group and has the greatest range. *P. tenellus* is separated in Bowman's key on the relative pronotal length-width ratio. My measurements indicate that



FIGS. 56–58. congener group of *Pycnoplectus*, male venters. Fig. 56. *Pycnoplectus congener* (Casey), sternites 4–7. Fig. 57. *Pycnoplectus longipennis* (Casey), sternites 4–7. Fig. 58. *Pycnoplectus difficilis* (LeConte), sternites 4–7.

there is no significant difference. External anatomy, as well as form of the aedeagus seem identical to that of *congener*, and *tenellus* must be considered a synonym.

MEASUREMENTS OF TYPE MALE: Head .316 mm long $\times$.324 mm wide, pronotum .316 mm long $\times$.324 mm wide, elytra .440 mm long $\times$.470 mm wide, abdomen .475 mm long $\times$.450 mm wide, antenna .475 mm long $\times$.08 mm wide, tergite ratio 1-1-1-2-1, sternite ratio 1-1.2-1-.8-2-.8-1.8, basal abdominal carinae maximum separation .123 mm.

DESCRIPTION: Head quadrate, convex vertex and lateral margins subrugose, pubescent foveae on line through middle of eyes, sulcus U-shaped, glabrous; gula punctate; mouthparts and antennae as for genus. Pronotum rounded-cordiform, disk with longitudinal sulcus not connected to glabrous antebasal impression; lateral foveae pubescent, connected to medial impression by arcuate antebasal sulci; prosternum convex, foveae as for genus; elytron with four antebasal foveae and subhumeral foveae; legs of males modified: Mesocoxa with small acute spine on mesoventral face, mesofemur swollen, metatrochanter with small curved laminoid process on posterior face. Male venter: Sternites 1 to 4 simple, unmodified; fourth-fifth intersegmental membrane with median process and small lateral tubercles; fifth sternite with deep basal fossa in median third, posterior margin trisinate upturned and black at center; sixth sternite with shallow subreniform impression in central three-fourths; seventh sternite convex, carina arcuate to right (fig. 56).

Aedeagus: Ventral lobe spatulate, slightly upturned distally with many canaliculi; right lateral lobe similar to *interruptus* but more stout; accessory phallus simple, lanceolate, and not curving (fig. 59).

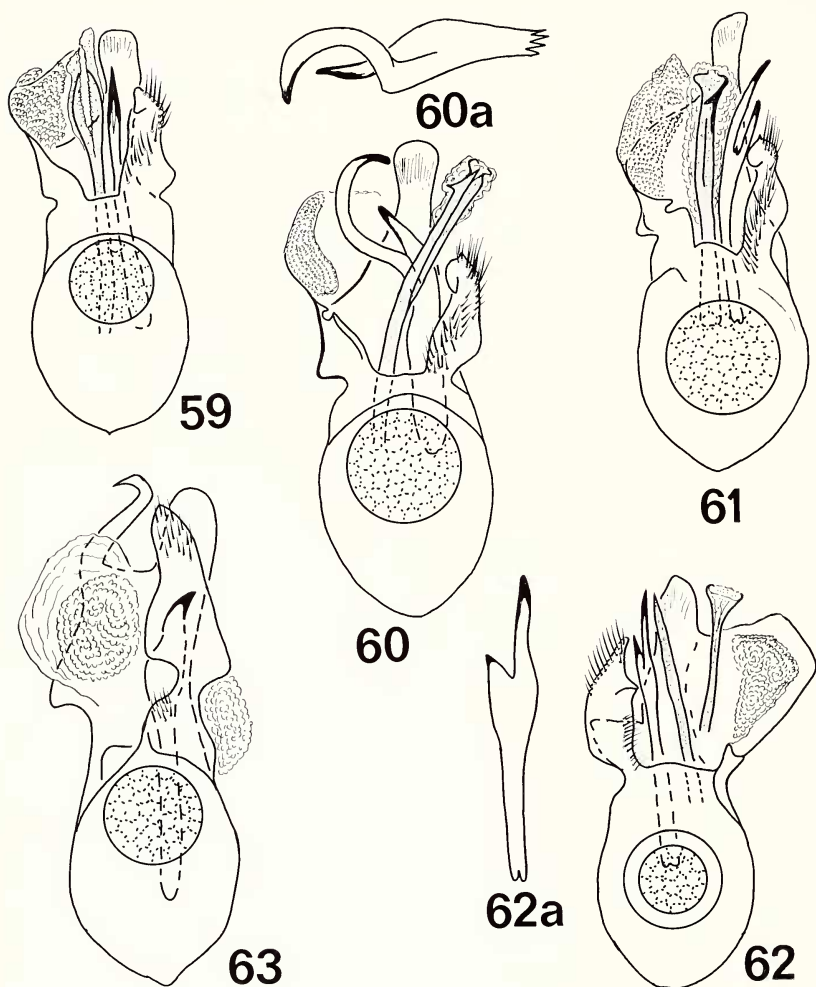
MATERIAL EXAMINED: CANADA: *Ontario*: ESSEX CO., Wheatley, nr. beach, 10 June 1967, Stephan, 1 male, sifting, Tilbury, 5 Sept. 1967, Stephan, 1 male, sifting (JAWC). UNITED STATES: *Washington, D.C.*: 1 male Type, 1 male paratype (USNM), 2 males (ICCM). *Connecticut*: LITCHFIELD CO., Colebrook, 2 July 1961, Wagner, Suter, Reichle, 1 male, sawdust (JAWC). *Pennsylvania*: 13 Oct. 1897, C. A. Schaffer, 1 male (OP); WESTMORELAND CO., Latrobe, St. Vincent, 1 male Type, 1 male paratype of *P. tenellus* (USNM). *Mississippi*: DESOTO CO., Hernando, 3 Apr. 1934, R. J. Nichols, 1 male (OP). *Ohio*: MAHONING CO., N. Jackson, swamp, 1 Sept. 1964, Suter, 2 males, beech stump (JAWC). *Michigan*: BERRIEN CO., Glenn, 14 Sept. 1947, Auerbach, 1 male, conifer log mold (OP); LIVINGSTON CO., E. S. George Reserve, 4 May 1960, Suter, 1 male, stump hole (JAWC). *Illinois*: CHAMPAIGN CO., Urbana, 5 males, 3 females, log mold (INHS), University Woods, Jan.-Feb. 1933, Park, 2 males, 2 females, log mold (OP), Brownfield Woods, 19 Apr. 1933, Park, 1 male (OP); COOK CO., DesPlaines, Carle Woods, 19 Apr. 1952, R. DePalma, 1 male, 4 females (OP), Palos Park, Maple Lake, 23 Apr. 1960, Wagner, 3 males, 1 female, oak TH (JAWC), Willow Springs, Paw Paw Woods, 1 male, TH (JAWC); DEWITT CO., Weldon State Park, 16 May 1966, Peck, 1 male, oak TH (JAWC); DUPAGE CO., Argonne National Laboratory, 10 Aug. 1967, Wagner and Suter, 1 male, oak forest floor (JAWC), Lisle, Morton Arboretum, 11 May 1959, Wagner, 1 male, under bark (JAWC); KANE CO., Lily Lake, Alt. 30, 3 mi. S., 22 Nov. 1960, Suter, 1 male, oak log mold (JAWC); SANGAMON CO., Sherman, 1 Feb. 1944, M. W. Sanderson, 2 males, (OP); VERMILION CO., Danville, 2 males, 2 females, log mold; 4 males, 1 female, stump mold (INHS); WILL CO., Monee, 11 Oct. 1952, Dybas, 1 male, 2 females (OP). The total number of specimens examined was 56 (41 males, 15 females).

HABITAT: The preference seems to be well rotted log mold.

***Pycnopectus longipennis* (Casey), new combination**

Euplectus longipennis Casey, 1908, p. 264. Type locality: St. Vincent, Westmoreland Co., Pennsylvania. Type female, USNM no. 38616. Subsequent references: Raffray, 1911, p. 34 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 33 (descript., key ref.).

DISCUSSION: This species is similar to *congener* but can be separated by the unmodified mesocoxae and mesotrochanters. The aedeagal accessory phallus is deeply bifurcate.



FIGS. 59–63. Figs. 59–62. *congener* group of *Pycnoplectus*, aedeagi. 59. *Pycnoplectus congener* (Casey), aedeagus (.229 mm long). 60. *Pycnoplectus falcatus*, new species, aedeagus (.281 mm long). 60a. Left lateral view of accessory phallus. 61. *Pycnoplectus longipennis* (Casey), aedeagus. 62. *Pycnoplectus difficilis* (LeConte), aedeagus, sinistral form. 62a. Lateral view of accessory phallus. Fig. 63. *Acolonia cavi-collis* (LeConte), aedeagus.

MEASUREMENTS OF PARATYPE MALE: Head .228 mm long $\times$.316 mm wide, pronotum .281 mm long $\times$.316 mm wide, elytra .440 mm long $\times$.440 mm wide, abdomen .457 mm long $\times$.404 mm wide, antenna .440 mm long, tergite ratio 1-1-1-2-1, sternite ratio .5-1-1-.5-.2-.4-1.2, basal abdominal carinae maximum separation .140 mm.

DESCRIPTION: General habitus identical to *congener*, separated from *congener* by following characters. Legs: Metatrochanter with small curved laminoid process of group; mesocoxa and mesotrochanter simple, without armature. Male venter: Sternites 1-4 simple; fourth-fifth intersegmental membrane with median process and small lateral tubercles; fifth sternite with deep basal fossa in median third, posterior margin of fossa arcuate, strongly upturned, almost sublaminoid, close to posterior margin of segment; sixth sternite with shallow subreniform impression; seventh sternite convex, carina arcuate to right (fig. 57).

Aedeagus: Ventral lobe spatulate as for group; accessory phallus bifid, gently curved, both rami strong and straight, mesial ramus slightly longer (fig. 61).

MATERIAL EXAMINED: *Pennsylvania*: WESTMORELAND CO., St. Vincent, 1 male paratype, 1 female Type (USNM). *Washington, D.C.*: 1 male (ICCM). *Maryland*: GARRETT CO., Keysers Ridge, 2.1 mi. E., 2500 ft., 18 June 1968, Peck, Ber. #129, 1 male, 2 females, log-stump litter (FMNH). *Virginia*: SMYTH CO., nr. Mount Rogers, Elk Garden Road, 5 Sept. 1961, C. Greever, 1 male, 1 female, sawmill debris (JAWC); WISE CO., Norton, 1.5 mi. S., 1500 ft., Peck, Ber. #133, 3 males, 1 female, log litter (FMNH). *Kentucky*: EDMONSON CO., Mammoth Cave National Park, Cabin Sink, 23 Apr. 1961, T. C. Barr and J. Wagner, 1 male, 1 female, log mold (JAWC); FLOYD CO., Jennie Wiley State Park, 7 July 1968, Peck, Ber. #134, 1 male, 1 female, log and stump mold (JAWC); HARLAN CO., Big Black Mountain, 4000 ft., 11 July 1968, Peck, Ber. #137, 1 male, log mold (JAWC). A total of 17 specimens (10 males, 7 females) from 8 collections.

HABITAT: Five of the above collections are from log mold, one from sawmill debris (sawdust?), the other two not known.

***Pycnopectus falcatus*, new species**

Type locality: Abingdon, Washington Co., Virginia. Holotype male (JAWC).

DISCUSSION: This new species is related to *difficilis* on the basis of the spined mesotrochanter, and to *congener* and *longipennis* on the basis of aedeagal form. The accessory phallus is unique, the left ramus is curved, resembling a sickle. The holotype male and paratype female

were collected by Claud Greever and given to Orlando Park, who donated them to my collection.

MEASUREMENTS OF HOLOTYPE MALE: Head .264 mm long $\times$.352 mm wide, pronotum .316 mm long $\times$.369 mm wide, elytra .492 mm long $\times$.563 mm wide, abdomen .580 mm long $\times$.510 mm wide, antenna .528 mm long, tergite ratio 1-1-1-1.9-1, sternite ratio 1-1-1-.5-.5-.5-1.5, basal abdominal carinae maximum separation .123 mm, total length 1.65 mm.

Head: Trapezoidal, vertex convex, margins subrugose, pubescent vertexal foveae equally distant from each other and eyes, foveae connected by moderately deep U-shaped glabrous sulcus; labrum with median point; antennae as for group; ventral surface finely punctate.

Thorax: Elongate pronotal discal sulcus not connected to median antebasal impression, lateral pubescent foveae connected to median impression by arcuate antebasal sulci; anterior prosternal foveae obsolete, lateral prosternal foveae as for genus; elytron with four antebasal foveae, one subhumeral fovea, sutural stria entire, discal stria one-half elytron length.

Legs of male: All femora considerably swollen, metatrochanter with recurved lamina on ventral face, as for group; mesotrochanter with small, acute, mesial spine, as described in *difficilis*.

Abdomen: Basal abdominal carinae on first two tergites divergent. Male venter: Sternites 1-4 simple; fourth-fifth intersegmental membrane with median process and rounded tubercle in lateral third; fifth sternite with deep basal fossa, apical margin trisinate, center upturned as described in *longipennis*; sixth sternite with shallow subreniform impression; seventh sternite convex, carina arcuate to right.

Aedeagus: Ventral lobe spatulate, slightly upturned apically; right lateral lobe recurved, with small terminal spine; accessory phallus bifid, left ramus broadly curved and sickle shaped, right ramus strong, lanceolate (fig. 60).

MATERIAL EXAMINED: *Virginia:* WASHINGTON CO., Abingdon, 1 mi. N., Cummings Woods, 7 Nov. 1961, C. Greever, 1 male Holotype, 1 female paratype, log mold (JAWC).

***Pycnoplectus difficilis* (LeConte), new combination**

Euplectus difficilis LeConte, 1850, p. 106. Type locality: Athens, Clarke Co., Georgia. Type male MCZC no. 6191. Subsequent references: Casey, 1884, p. 100. Brendel and Wickham, 1890, p. 66 (descript., key ref., fig. 109). Raffray, 1911, p. 33 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 30 (descript., key ref.).

Euplectus longissimus Brendel, 1890, p. 71. Type locality: South Carolina, Georgia. Lectotype male Horn collection ANSP no. H9448.

Subsequent references: Raffray, 1911, p. 34 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 33 (descript., key ref.). **New synonym.**

DISCUSSION: This species has the typical habitus of the *congener* group. The distinguishing characters include 1) the trochanter characters of the mesolegs and metalegs, 2) the straight fossa margin of the fifth sternite, and 3) the unique aedeagus. There is one occurrence of aedeagal mirror imagery in *difficilis* among three genitalia examined. The type male showed the sinistral condition with the left lateral lobe setose. I examined the lectotype male of *Euplectus longissimus*, which I designated, and found it to be conspecific with *difficilis*. The aedeagus of the lectotype has the dextral form with the right lobe setose.

DESCRIPTION: General appearance identical to *congener*. Male legs: Mesotrochanter with acute spine directed posteroventrally, quite near coxa; metatrochanter with small laminoid lobe. Male venter: Sternites 1 through 4 simple; fourth-fifth intersegmental membrane with prominent median process, lateral tubercles rounded, equally distant from median process and lateral margin; fifth sternite with deep basal fossa in median third, posterior margin unique: Straight to slightly concave through length of entire fossa; sixth sternite with shallow subreniform impression; seventh sternite convex, carina arcuate to right (fig. 58).

Aedeagus: Two forms known, dextral and sinistral, dependant on transposition of right-left lateral lobes; ventral lobe spatulate with rounded point; accessory phallus bifid, ventral ramus short (fig. 62—sinistral form, 62a—lateral view accessory phallus).

MATERIAL EXAMINED: *Georgia:* CLARKE CO., Athens, 1 male Type, LeConte collection (MCZC); RABUN CO., Black Rock Mountain State Park, 16 Sept. 1959, Suter and Wagner, 1 male, 2 females, white oak TH (JAWC). *South Carolina* (?), *Georgia* (?), localities cited by Brendel for *longissimus*, no locality data on lectotype male, 1 (ANSP). The total number of specimens examined was five (three males, two females).

HABITAT: The only habitat reported is white oak tree hole.

Genus *Acolonia* Casey

Acolonia Casey, 1893, p. 443, 454. Type species, *Acolonia cavicollis* (LeConte), 1878, p. 387 (original genus *Euplectus*). Subsequent references: Raffray, 1903–04, p. 95 (cat. citation); 1908, p. 95 (descript., distr.); 1911, p. 38 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 39, 144 (descript., key ref., designa-

tion of type species). Park, 1953, p. 305, 314 (key ref., cat. citation). Arnett, 1961, p. 315, 321 (key ref., cat. citation).

DISCUSSION: This monotypic genus resembles *Pycnoplectus* more than *Euplectus*. The simple venter of the male, and form of the aedeagus separate it from these genera. The short sulci above and below each eye are distinguishing features which immediately separate *Acolonia* from the other three genera presented here. Thus far it has only been collected in Florida and is known only from the type, and a subsequent single female collected in 1955. Considering the intensity of collecting in Florida in recent years, this must be considered one of the most uncommon pselaphid genera.

DESCRIPTION: Form stout and convex, rather like *Pycnoplectus*.

Head: Eyes prominent, toward ventral surface, lateral margins strong, connected with frontal ridge so that discounting eyes, head has strong trapezoidal outline; vertexal foveae nude, connected by deep V-shaped ambient sulcus, vertex medially convex with short median carina to occiput; short sulcus above and below eye; ventral surface punctate.

Thorax: Pronotal disk convex, not impressed, punctulate; antebasal fovea small, deep, in large rounded transverse depression which does not connect with deep lateral foveae; prosternum long, not carinate; lateral prosternal foveae large, pubescent, near coxal cavity; anterior prosternal foveae replaced by glabrous sulcus; elytra widest part of body, nearly parallel at sides, each elytron with four antebasal foveae; sutural stria complete, discal stria shallow and short; subhumeral foveae with complete stria.

Legs: Relatively unmodified; mesofemora and metafemora inflated; mesotibia with distinct, but small distal spine.

Abdomen: Hypotergite and five visible tergites, first two with strongly diverging carinae; 1 through 3 subequal; fourth much longer; fifth as long as first. Male venter: Sternites 1 through 6 simple, unmodified; seventh sternite with two opercular plates, junction "carina" arcuate to right.

Aedeagus: Large basal capsule as described for *Pycnoplectus*; ventral lobe strong, deeply incised; right lateral lobe very large (fig. 63).

***Acolonia cavicollis* (LeConte)**

Euplectus cavicollis LeConte, 1887, p. 387. Type locality: Tampa, Hillsborough Co., Florida. Type male MCZC no. 6192. Subsequent references: Brendel and Wickham, 1890, p. 57 (descript., key ref.).

Acolonia cavicollis (LeConte), Casey, 1893, p. 443, 454 (defined new genus with *cavicollis* as type species). Raffray, 1903, p. 95 (cat.

citation); 1911, p. 38 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 39 (descript., key ref.).

DISCUSSION: Since this is the only species in the genus it is easily separated by the features previously mentioned in the generic discussion and the generic key.

MEASUREMENTS OF TYPE MALE: Head .246 mm long $\times$.334 mm wide, pronotum .299 mm long $\times$.352 mm wide, elytra .460 mm long $\times$.510 mm wide, abdomen .528 mm long $\times$.440 mm wide, antenna .480 mm long, tergite ratio 1-1-1-1.8-1, sternite ratio 1-1-8-.7-.5-.5-2.0, basal abdominal carinae of first and second tergites: minimum separation .088 mm curving to maximum separation .158 mm.

REDESCRIPTION OF TYPE MALE: Form moderately robust, dark brown; pubescence dense and suberect; head wider than long, smaller than pronotum; eyes large, tempora short and strongly convergent; vertexal foveae nude, connected with deep V-shaped ambient sulcus, vertex densely but finely punctulate laterally, medially convex with short antebasal carina; antennal club of last three segments; terminal segment as long as preceding three united; ventral surface of head punctate; prosternum coarsely punctate; pronotal disk convex, punctulate, not impressed; antebasal fovea small, deep, in large rounded transverse depression; lateral foveae deep, not connected to median depression; elytra as described for genus; basal abdominal carinae on first two tergites curved and strongly divergent. Male venter: Seven sternites in male apparently unmodified except for fifth sternite with small basal impression, .12 mm long in middle; sixth sternite with weak lateral glabrous depressions; seventh with carina arcuate to right.

Aedeagus: Ventral lobe distally bipartite: Left part in form of strong recurved spine, right part broadly spatulate; right lateral lobe setiferous, large, roundly incised in basal half; accessory phallus simple, not divided (fig. 63).

MATERIAL EXAMINED: *Florida:* HILLSBOROUGH CO., Tampa, 1 male Type (MCZC); CLAY CO., Highland, 5 mi. N., 23 June 1955, H. Dybas, 1 female, under pine bark (JAWC).

Genus *Leptoplectus* Casey

Leptoplectus Casey, 1908, p. 266. Type species: *Leptoplectus pertenuis* (Casey), 1884, p. 109. Subsequent references: Raffray, 1911, p. 35 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 34, 144 (descript., key ref., designation of Type species).

Euplectus: Park, 1953, p. 314 (cat. citation). Arnett, 1961, p. 321 (cat. citation).

DISCUSSION: This is a relatively abundant monotypic genus in Eastern North America. It is separated from *Euplectus* by its pubescent vertexal foveae, one sensory fossa in the eleventh antennal segment, none of the male venter modifications characteristic of *Euplectus* or *Pycnoplectus*, and a distinctive aedeagus. The closest relative of *Leptoplectus* is a new, undescribed genus represented by a single female from Kyoto, Japan. The general appearance and notched labrum are identical to that of *Leptoplectus*, but it lacks anterior prosternal foveae.

DESCRIPTION: Body slender, small, sides parallel, color pale brown, elytra sometimes darker.

Head: Rounded trapezoidal, evenly and sparsely punctulate, tempora long, eyes placed low on sides; vertex slightly convex, foveae small, pubescent, connecting with broad glabrous frontal impression by shallow constricted sulci; frontal margin upturned, darkened and medially pointed; labrum with deep median U-shaped notch; mandibles simple, lacking spinoid seta; occiput with small median basal notch (fig. 14); ventral surface punctulate with short, aciculate, semi-appressed anteriorly directed setae; terminal segment (eleventh) of antenna with subapical fossa containing several sensilla (fig. 11).

Thorax: Pronotum punctulate, disk with small oval impression that connects weakly with antebasal impression; lateral foveae pubescent, connected to antebasal impression by very weak sulci; lateral margins with small but distinct, rounded denticle next to fovea; lateral prosternal foveae (LPF) pubescent; anterior prosternal foveae (APF) pubescent; prosternum convex, impunctate. **Legs:** Simple, procoxal and mesocoxal cavities confluent, metacoxal cavities contiguous; elytra quite variable with respect to number of antebasal foveae: Bifoveate, with sutural and humeral, or trifoveate, with sutural, discal, humeral; on same individual each elytron can be different; subhumeral fovea with entire stria.

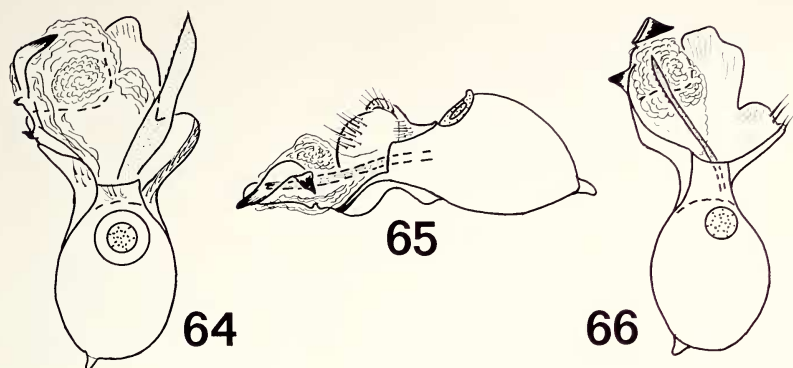
Abdomen: Hypotergite and five visible tergites, first two visible tergites with basal carinae; fourth larger; fifth tergite in some females with middorsal terminal spine; females with six sternites, male with seven; seventh sternite with two plates, uniting carina arcuate to morphological right.

Aedeagus: Form distinct but with considerable variation; basal capsule elongate with basal nipple; left lateral lobe with spines; ventral lobe spatulate; right lateral lobe with setae (figs. 64, 65, 66).

***Leptoplectus pertenuis* (Casey)**

Euplectus pertenuis Casey, 1884, p. 109. Type locality: Washington, D.C.

Type female USNM no. 38607. Subsequent references: Brendel and



FIGS. 64–66. *Leptoplectus pertenuis* (Casey). 64 & 66. Dorsal view of aedeagi, two variations (.190 mm long). 65. Left lateral view aedeagus.

Wickham, 1890, p. 70 (descript., distr. data, key ref.). Raffray, 1903, p. 91 (cat. citation).

Leptoplectus pertenuis (Casey), 1908, p. 266 (first placed in genus). Raffray, 1911, p. 35 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 35 (descript., key).

Leptoplectus insolens Casey, 1908, p. 268. Type locality: St. Vincent, Westmoreland Co., Pennsylvania. Type male USNM no. 38609. Subsequent references: Raffray, 1911, p. 35 (cat. citation). Leng, 1920, p. 128 (cat. citation). **New synonym.**

Leptoplectus exilissimus Casey, 1908, p. 269. Type locality: Cincinnati, Hamilton Co., Ohio. Type male USNM no. 38610. Subsequent references: Raffray, 1911, p. 35 (cat. citation). Leng, 1920, p. 128 (cat. citation). Bowman, 1934, p. 35 (descript., key). **New synonym.**

DISCUSSION: There have been four species described in *Leptoplectus*, all by Casey. One, *filiformis*, is clearly *Euplectus* and is included in this genus. The remaining species have been described from only five specimens: *pertenuis*, one Type and one paratype female; *insolens*, one Type male; *exilissimus*, one Type and one paratype male. I have examined these specimens as well as 100 males, and 119 females from 70 separate collections over the total range, and I have not been able to distinguish more than one species on the basis of external and aedeagal anatomy. There was relatively little variation in size, but 50 males across the entire range were measured for head and pronotum dimensions, and from these a head/pronotal index was derived (Mayr et al., 1953, p. 136). The head/pronotal indices for the types of *insolens* and *exilissimus* were well within the

limits of expected deviation for the 50 males of *pertenuis*. Although the samples studied are small, I feel that only one species population is present.

MEASUREMENTS OF *INSOLENS* TYPE MALE: Head .228 mm long $\times$.264 mm wide, pronotum .246 mm long $\times$.250 mm wide, elytra .369 mm long $\times$.352 mm wide, abdomen .440 mm long $\times$.305 mm wide, antenna .316 mm long $\times$.08 mm wide, basal abdominal carinae maximum separation .075 mm.

MEASUREMENTS OF *EXILISSIMUS* TYPE MALE: Head .193 mm long $\times$.228 mm wide, pronotum .213 mm long $\times$.213 mm wide, elytra .334 mm long $\times$.316 mm wide, abdomen .352 mm long $\times$.264 mm wide, antennae damaged, basal abdominal carinae maximum separation .06 mm.

DESCRIPTION: Total length 1.0 to 1.3 mm; color brown, form depressed, sides parallel; head rounded trapezoidal with two small pubescent vertexal foveae; surface lightly and finely punctulate; front with shallow glabrous impression, frontal margin upturned, darkened, medially pointed; sulci from foveae to frontal impression constricted on line through anterior half of eyes; labrum truncate with deep median U-shaped notch (fig. 14). Antennae, pronotum, elytra, legs, and abdomen as described for genus.

Aedeagus: Basal capsule elongate with basal nipple; left lateral lobe with two lanceolate processes (these vary considerably in degree of curvature and sclerotization but always occur in same relative position and should be viewed at several angles) usually only tip of process darkened, in some (including Type of *insolens*) darkened blade quite long; right lateral lobe curved with many setae; ventral lobe spatulate; no accessory phallus; phallus often obscured by antepical membrane, flat and spatulate, or bifurcate (figs. 64–66).

MATERIAL EXAMINED: *Washington, D.C.*: 1 female Type (USNM), 2 males (ICCM). *Rhode Island*: WASHINGTON CO., Rickville, nr. Ell Pond, 4 July 1961, Wagner, 1 male, mountain laurel duff (JAWC), S. Kingston, Great Swamp, 3 July 1961, Suter, Wagner, Reichle, 5 males, 7 females, sawdust (JAWC). *New Jersey*: CAMDEN CO., Clementon, 27 July, 1 male, 1 female; GLOUCESTER CO., Woodbury, 24 June, 2 males, 4 females, Westville, 10 Nov., 8 males, 12 females, H. W. Wenzel collection (OSUC). *Pennsylvania*: DELAWARE CO., Castle Rock, 1 male, Newton Square, 1 male (OSUC); PHILADELPHIA CO., Frankford, 1 male, 1 female (OSUC); FRANKLIN CO., Penn-Mar, 27 July 1959, Suter and Wagner, 2 males, 3 females, log mold (JAWC); WESTMORELAND CO., St. Vincent, 1 female (USNM), 1 male Type of *insolens* (USNM), 1 male (OSUC), 1 male, 1 female (CMNH), Seward, 28 July 1959, Suter and Wagner, 4 females (JAWC), Chest-

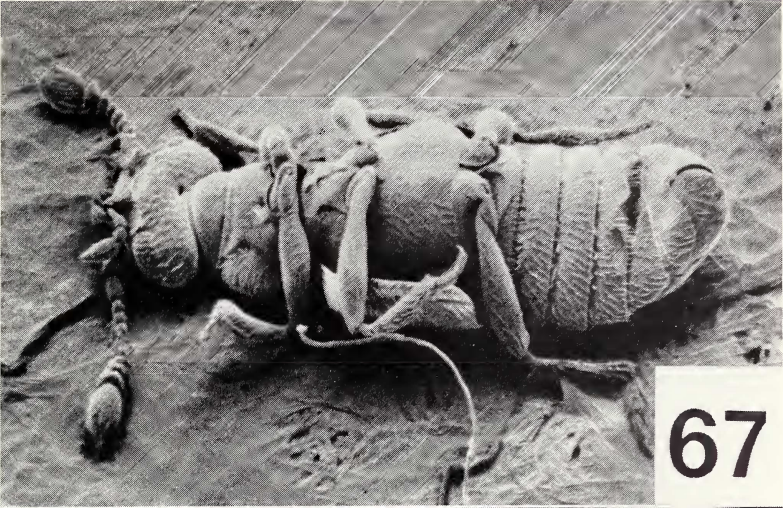
nut Ridge, E. of Youngstown, 16 Sept. 1961, Wagner, 2 females, log mold (JAWC). *Delaware*: NEW CASTLE CO., Christiana, 31 May 1953, R. S. Howard, 2 males, 5 females (OP). *Maryland*: Green Ridge Mountain, 16 Dec. 1946, H. Ross, 1 male, 1 female, forest litter (OP); BALTIMORE CO., Baltimore, 22 Apr. 1934, T. Edwards, 1 male, 1 female (OP); FREDERICK CO., South Mountain, Middletown, 3 mi. N.W., 21 Nov. 1961, H. Dybas, 1 male, 2 females, hollow stump debris (JAWC); GARRETT CO., Deer Park, 3 mi. W., 25 July 1959, Suter and Wagner, 1 female, sawdust (JAWC). *Virginia*: SMYTH CO., nr. Mount Rogers, Elk Garden Road, 3 Sept. 1962, C. Greever, 1 male; 5 Sept. 1961, Greever, 1 male, 1 female, sawmill debris (OP). *North Carolina*: BUNCOMBE CO., Ashville, 10 mi. W, 1 female, leaf mold (OP); POLK CO., Tryon, 21 Nov. 1949, L. Eisenbach, 3 males, 1 female, TH (OP). *South Carolina*: OCONEE CO., Oconee State Park, 100 ft., 21 July 1967, Peck and Fiske, Ber. #83, 12 males, 4 females, log litter (FMNH). *Georgia*: DADE CO., Cloudland Canyon State Park, 14 Apr. 1963, Steeves, 2 males, 2 females, forest floor nr. dead wood (HS), 19 June 1967, Peck and Fiske, Ber. #64, 5 males, 6 females, sawdust (FMNH); RABUN CO., Mountain City, Black Rock Mountain State Park, 16 Sept. 1959, Suter and Wagner, 3 males, 1 female, log mold (JAWC), Rabun Bald, 3630 ft., 30 May 1964, Steeves, 1 male, 1 female, oak TH (HS); WHITE-UNION CO., Tesnatee Gap, 3100 ft., 20 July 1967, Peck and Fiske, Ber. #81, 2 males, 2 females, log mold (FMNH). *Florida*: JACKSON CO., Florida Caverns State Park, 6 Apr. 1969, Peck, Ber. #159, 2 males, 2 females, log leaf litter 131 lbs., 130 liters (JAWC); LIBERTY CO., Torreya State Park, 4 Apr. 1969, Peck, Ber. #158, 1 male, 1 female, pine log litter 194 lbs., 185 liters (FMNH). *Alabama*: CULLMAN CO., nr. Cullman, Hurricane Creek Park, 6 July 1963, Steeves, 1 female, log mold; FRANKLIN CO., nr. Hodges, Rock Bridge Canyon, Steeves, 1 female; JACKSON CO., nr. Princeton, Horseshoe Cave Sink, Steeves, 2 males, moss at cave mouth; 1 male, 1 female, log mold; MARSHALL CO., Grant, Guffey Cave, Steeves, 1 male, debris in entrance; PIKE CO., nr. Troy, The Pocosin, Steeves, 1 female, floor litter; SHELBY CO., Oak Mountain State Park, 26 Mar. 1961, Steeves, 1 female, log mold, 2 females, TH; nr. Helena, 1 female, log mold; WALKER CO., nr. Jasper, Devils Ladder, Steeves, 1 female, hollow oak (all Alabama collections HS). *Tennessee*: BLOUNT CO., 1953, T. Copeland, 5 males, sawdust (OP); OVERTON CO., Standing Stone State Park, Steeves, 1 female, stump mold (HS), Pickett State Park, Steeves, 1 female, log mold (HS); SEVIER CO., Smoky Mountains National Park, 2.5 road mi. above Chimney Campground, 3600 ft., 1 male, basswood log (OP); VAN BUREN CO., Fall Creek Falls State Park, 1 male, floor litter (JAWC).

Kentucky: FLOYD CO., Jennie Wiley State Park, 7 July 1968, Peck, Ber. #134, 1 male, 3 females, log and stump litter 188 lbs., 164 liters (FMNH); HART CO., Munfordville, 4 mi. N. on US 31W, 31 Aug. 1961, Suter and Wagner, 4 males, 3 females, floor litter (JAWC); PULASKI CO., Burnside, 3 Sept. 1948, Ross and Stannard, 2 males, log mold (OP), 1 male, 2 females (INHS). *Ohio*: HAMILTON CO., Cincinnati, 17 May 1906, C. Dury, 1 male, 3 females (CMNH), 1 male Type of *exilissimus* (USNM). *Indiana*: MONROE CO., Bloomington, 21 Apr. 1934, M. L. Connerly, 1 male, 2 females (OP). *Illinois*: ADAMS CO., Quincy, 1 male, 3 females; Spring Lake Country Club, 1 male, log mold; Coe's Spring, 24 Apr. 1944, Rev. Long, 2 males, stump mold; 1 male, 1 female, TH (all INHS); ALEXANDER CO., Thebes, 3 females, on log in beech woods (INHS); CARROL CO., Palisades State Park, 2 males, 1 female (INHS); CHAMPAIGN CO., Urbana, 19 Apr. 1934, Park, 1 male (OP), Mahomet, 3.5 mi. S., 2 females, oak TH (INHS); HARDIN CO., Eichorn, 1 female (INHS); MASON CO., Havana, 1 male, 1 female, log mold (INHS); LASALLE CO., Starved Rock State Park, 1 male, 1 female, log mold (INHS); PIATT CO., White Heath, 17 May 1934, Park, 1 male, 1 female (OP); POPE CO., Herod, 12 Oct. 1933, H. Ross, 1 male, 1 female, log mold (INHS); PUTNAM CO., Magnolia, 1 female, floor litter; UNION CO., Alto Pass, 1 female, floor litter, Cobden, 23 Aug. 1960, Wagner, 1 female, log mold, Ware, 1 male, 4 females, log mold (JAWC); VERMILION CO., Danville, 3 females, log mold; 1 male, 2 females, stump (INHS). *Iowa*: JOHNSON CO., nr. Solon, Lake McBride State Park, 14 Apr. 1963, Suter and Berry, 2 males, 3 females, oak TCH (JAWC). The total number of specimens examined was 224 (103 males, 121 females).

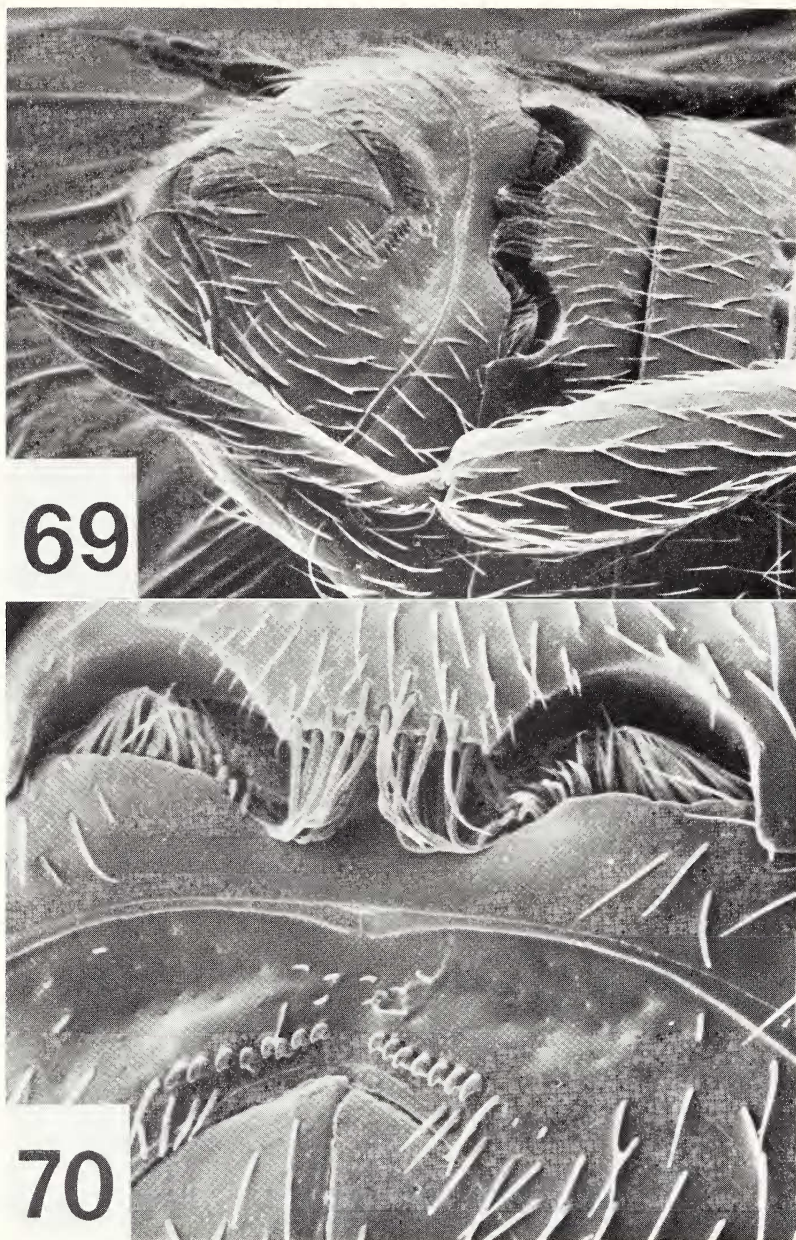
HABITAT: The majority of collections were from log mold with about 25 percent as many from floor litter, tree holes, and sawdust.

ECOLOGY

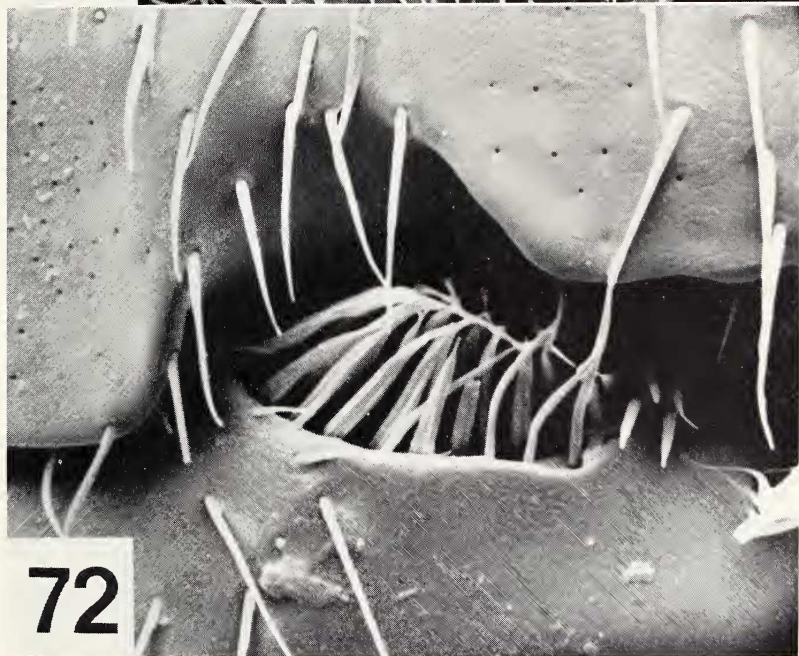
Euplectus, *Pycnoplectus*, *Leptoplectus*, and *Acolonia* are most frequently found in the Nearctic in the deciduous forest biome and its extensions. Here these beetles are much more common and have larger populations in the climax associations, although there are a few less common species which may be limited to preclimax stages; about 85 percent of all pselaphids live in leaf and log mold of the forest floor. Pselaphidae are predacious and feed on a variety of mold-inhabiting animals. Apparently their role in the community is active predation upon cryptozoic herbivores. Pselaphids help to maintain the balance in humus formation by consuming mites, Collembola, and other small creatures.



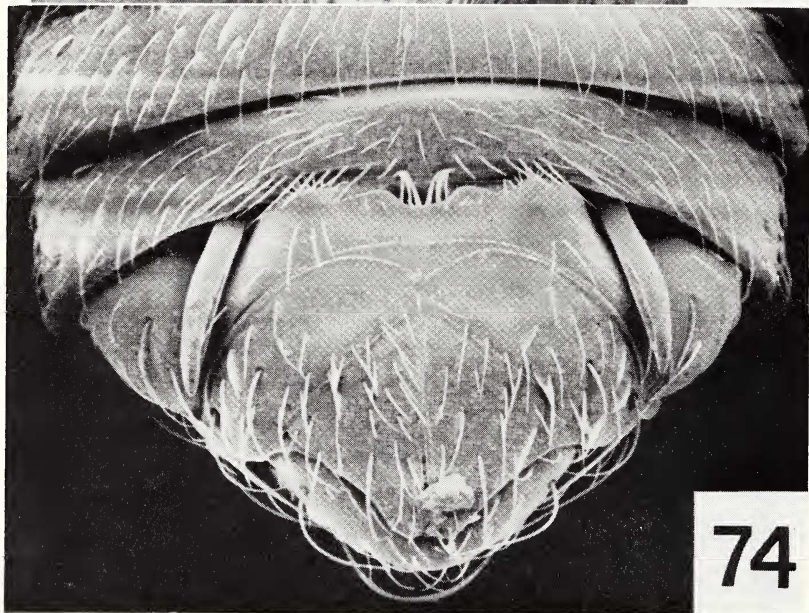
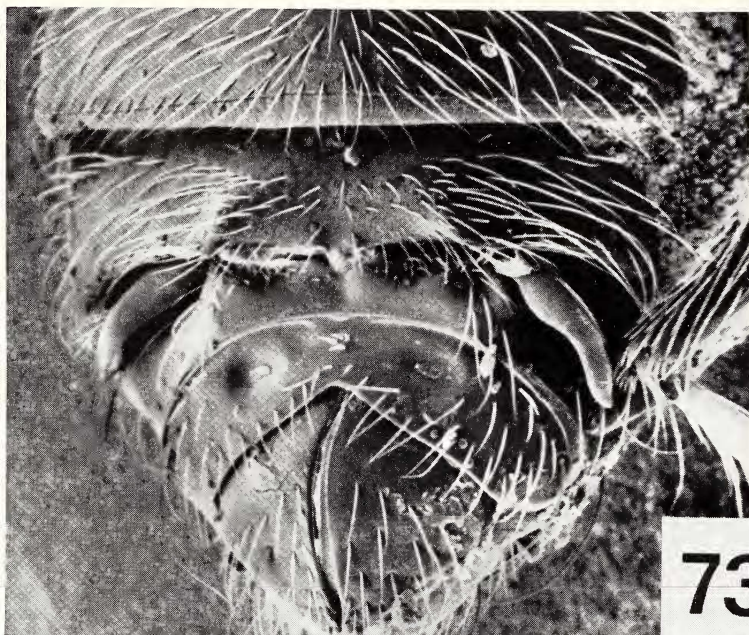
FIGS. 67-68. *Euplectus longicollis* Casey, SEM photograph of male from Kentucky, Edmonson Co., Mammoth Cave National Park, Bruce Hollow. 67. Ventrolateral view. 68. Sternites 3-7.



FIGS. 69-70. *Euplectus karsteni* (Reichenbach), SEM photograph of male from Illinois, Cook Co., Skokie. 69. Left oblique view of venter. 70. Sternites 4-7, central portion (note attachment of central setae of fourth sternite, and sensillae of sixth).



FIGS. 71-72. *Euplectus karsteni* (Reichenbach), SEM photograph of male from Switzerland, Geneva. 71. Sternites 4-7 (note variation in attachment of central setae of fourth sternite). 72. Detail of setal tuft in fossa of fifth sternite.



FIGS. 73-74. Fig. 73. *Pycnoplectus sexualis* (Casey), SEM photograph of a male from Washington, D.C., sternites 3-7. Fig. 74. *Pycnoplectus spinifer* (Casey), SEM photograph of a male from Alabama, Marshall Co., Guntersville, nr. Griffith Cave, sternites 3-7.

FEEDING. Pselaphids are known to feed on oribatid mites, hoplodermatid mites, gamasid mites, ant eggs and larvae, fly larvae, collembolans, small flies, and pieces of earthworms (Park et al., 1950). Englemann (1956) reported *Euplectus* (one male, two female species) feeding upon podurid and isotomid Collembola. I have fed *E. confluens* larvae of *Drosophila*, *Tubifex* worms, mites, and collembolans. They fed upon the larvae with apparent reluctance and only after the integument had been broken. This is in contrast to the apparent gusto shown by many other pselaphid genera when fed *Drosophila* larvae under laboratory conditions. *Tubifex* worms were attacked and eaten by *confluens* especially when the worms were cut into small pieces. Mites and Collembola and a variety of other small arthropods were usually collected alive with the pselaphids, but the beetles were not seen feeding upon any of the forms present except one unidentified mite.

PREDATORS. The red-backed salamander, *Plethodon cinereus* (Green), is the only known predator of pselaphids. Park (1947, p. 103, 115) reports *Batrisesodes hairstoni* Park (Clarke County, Indiana) from this salamander's stomach; Park and Edgren (1950) add a female *Tychus minor* LeConte and a male *Melba sulcatula* (Casey) from Berrien County, Michigan. I collected *P. cinereus* with 125 female *Eutyphlus* by Berlese funnel, from floor duff under *Rhododendron* on Chestnut Ridge, East of Youngstown, Pennsylvania, 16 September 1961. A gut examination produced a partly digested *Eutyphlus* female. Although none of the *Euplectus* complex is known from predation records, members of the same tribe, *Melba* and *Eutyphlus*, have been eaten. Evidently any pselaphid in log mold or floor litter might be eaten by small salamanders. Arthropod predation undoubtedly occurs, but has not been substantiated.

SYMBIOSIS. Mites: "It is well known that gamasoid mites are associated with beetles, either as phoretics or ectoparasites. On one occasion, a sample from a basal tree hole (July 4, 1949 at Saugatuck, Michigan) yielded three males and 29 females of *E. confluens*. Of these, 12 females were parasitized by gamasoids, each female having from two to 12 mites" (Park et al., 1950, p. 39). During my examination of several hundred *Euplectus* and *Pycnoplectus* only six percent had mites on them. Since they were examined as dried, point mounted specimens, most of the associated mites may have fallen off during Berlese collection in alcohol, and subsequent sorting and mounting. Of the beetles seen alive, none was seen carrying mites. Nematodes: A Berlese collection from a compost pile on 3 November 1960, Friendship, Adams County, Wisconsin produced several *E. signatus*. Larval nematodes were attached to the cuticle of five *Eu-*

plectus, two different scydmaenids, and a cryptophagid, *Diplocoelus rudis* LeConte. There were from two to six nematodes on each pselaphid, located apparently at random. Apparently they were not ectoparasites, but phoretics. Hyman (1951, Vol. III, p. 291) discusses the ecology of Rhabditoidea. These generally terrestrial worms often inhabit compost piles. Immature stages of certain species are often transported by insects to other habitats, and the worms may parasitize the insects in certain stages of development. This occurrence of nematodes on *Euplectus* may parallel the situation on the dung beetle, *Aphodius*, as outlined by Hyman. Another collection of *Euplectus* six months later on 10 April 1961 at the same site produced no nematodes. Ants: Several collections from tree holes and log mold contained ant colonies. *Euplectus* and *Pycnoplectus* were present in some of these collections, but their association with ants, if any, is speculative. It is possible that the beetles are facultative synecthrans, but in the ample literature dealing with social insects symbiont euplectines are not mentioned.

POPULATION DENSITIES. Concentrated litter, log mold, and tree hole mold were taken to the laboratory in plastic bags which held about two liters or two kilograms (wet weight) of the mold. Many collections did not yield euplectines, but unfortunately no record was made of these for comparative study. The average sample of mold (two to four kilograms) yielded only small numbers of *Euplectus*, *Pycnoplectus*, and *Leptoplectus*. The number of beetles in each collection, the totals and numbers of each sex have already been listed for each species. The following two collections provide some data on relative number of beetles per volume and weight of habitat substrate. 1) A *Tilia* tree hole in Carle Woods (Illinois, Cook County, Des Plaines, 15 March 1959) contained 16 male and 21 female *E. confluens*, approximate volume, two liters; wet weight, 1775 grams; dry weight, 775 grams; or one *confluens* per 54 ml. of mold, or one per 48 grams of wet mold. 2) An *Acer* tree hole in Raccoon Grove (Illinois, Will County, Monee, 18 December 1959) contained seven male and six female *E. confluens*, approximate volume, one liter; wet weight 1150 grams; dry weight, 325 grams; or one *confluens* per 77 ml. of mold, or one per 88 grams of wet mold. Combined these two collections give: One *confluens* per 60 ml. mold, or one per 58 grams of wet mold. In comparison Park (Park et al., 1950, p. 39) found one pselaphid per 109 grams of wet beech tree hole mold from a climax Michigan forest, and an average of 22 pselaphids per beech tree hole. His figures for *E. confluens* were 109 per beech tree hole, and one *confluens* per 127 grams of wet beech mold. In tree hole number 2 above there were also two male and four female *P. linearis*,

one *linearis* per 167 ml. of mold, or one per 192 grams of wet mold. Under optimum conditions any of the species might be locally abundant. For example, one sawdust pile in Alabama yielded 22 male and 23 female *P. spinifer* by Berlese, and another larger sawdust pile at Seward, Pennsylvania produced 27 male and 21 female *P. linearis* in two days by hand collecting under slash, and by Berlese.

HABITAT. The primary factors which control the distribution of the four genera are the biotic and physical influences of the floor stratum of forests. The stability of the climax forest and later stages of forest microseres meets the requirements of these animals. Their small size enables them to interpose between themselves and the macroenvironment an extensive shield of decaying vegetable material. Here in dark, cool, moist, and above all stable environments they find near optimum conditions.

MICROHABITAT. Probably as many as 90 percent of the species in the *Euplectus* complex are normally found in decayed woody material such as log mold and tree holes, but a few species are found more frequently in other specific kinds of moist litter. Within these habitats the effects of microsuccession are evident. Early stages in the microsere are seldom inhabited, although some populations may thrive under loose bark. Generally, the nearer to the mounding stage in the log microsere, the greater chance for successful occupation of the debris by populations of euplectines. For most logs a gradual development on a temperate forest floor of from five to 10 years is best; for tree holes the time is slightly longer; for manure piles, haystacks, and sawdust piles five to 20 years development produces suitable conditions.

In the taxonomic section complete habitat data were listed when available. Of 516 collections, 160 had no habitat data. The remaining 356 collections had habitat niche information. This is summarized in two tables. Table 1 lists the recorded number of times a particular species was collected in a given habitat, and Table 2 lists the percentages of occurrence for each species.

TREE HOLES. The ecology of the tree hole habitat has been studied by Park and others in some detail (Park et al., 1950; Park and Auerbach, 1954). Of all the tree holes studied by Park, 58 percent contained pselaphids. Of the four genera in this study 49.1 percent of 356 collections, and 11 of the 23 species were taken from tree holes. These high numbers are partially due to the preference of *E. confluens* for this habitat niche. In Park's study, 80 percent of the pselaphids from tree holes were *confluens*, and in my collections of the *Euplectus* complex species from tree holes, 69 percent were *confluens*. Beech (*Fagus grandifolia*), maple (*Acer saccharum*), and

TABLE 1 (continued).

	Beech tree hole	Maple tree hole	Oak tree hole	Other tree hole	Total tree hole	Under bark	Sawdust	Log mold or stump mold	Leaf mold	Floor litter	Manure	Compost	Mammal nest	Moss or fungus	Black or white light	Unknown	Total
<i>Pycnoplectus</i> (continued)																	
<i>sexualis</i>				1	1		1			1			* dusk flight		* 1	3	7
<i>spinifer</i>				2	2	2	4	5		7					w1	8	29
<i>infossus</i>	1			1	2		3	2								2	9
<i>congener</i>			2	2	4	1	1	7		1						11	25
<i>longipennis</i>							1	5								2	8
<i>falcatus</i>			1					1									1
<i>difficilis</i>					1											2	3
																	169
<i>Leptoplectus</i>																	
<i>pertenuis</i>			3	4	7	1	6	24	2	8				m1		24	73
<i>Acolonia</i>																	
<i>cavicolis</i>						1										1	2
	52	26	27	71	176	19	26	72	5	25	13	8	2	3	5	160	516

Habitat Niches from which collections were made. Habitat data was not available for all collections, but the total number of collections is listed in the column on the right. Other numbers indicate the number of collections per habitat for each species. Abbreviations: Moss (m) or fungus (f); black (b) or white (w) light.

TABLE 2 (continued).

	Beech tree hole	Maple tree hole	Oak tree hole	Other tree hole	Total tree holes	Under bark	Sawdust	Log mold or stump mold	Leaf mold	Floor litter	Manure	Compost	Mammal nest	Moss or fungus	Black or white light	Total no. of known habitats
<i>Pycnolectus</i> (continued)																
<i>sexualis</i>				25	25		25		25						flight	4
<i>spinifer</i>				9.5	9.5		19.0	23.8	33.3						25	21
<i>infossus</i>		14.3		14.3	28.6		42.8	28.6							w	7
<i>congener</i>			14.3	14.3	28.6		7.1	50	7.1							14
<i>longipennis</i>							16.7	83.3								6
<i>falcatus</i>							100									1
<i>difficilis</i>			100		100											1
<i>Leptoplectus</i>																
<i>pertenus</i>			6.1	8.2	14.3	2.0	12.2	49	4.1	16.3				m	2.0	49
<i>Acolonia</i>																
<i>cavicollis</i>						100										1
TOTAL %	14.6	7.3	7.6	19.9	49.1	5.3	7.3	20.2	1.4	7.0	3.6	2.2	0.5	0.5	1.6	356

This table lists the percentages of occurrence in a given habitat niche based on collections where habitat was known. Abbreviations: Moss (m) or fungus (f); black (b) or white (w) light.

oak (*Quercus* spp.) have provided most of the tree holes, and the following trees have produced some records: hemlock (*Tsuga*), hickory (*Carya*), tulip-tree (*Liriodendron*), sycamore (*Platanus*), basswood (*Tilia*), cucumber magnolia (*Magnolia acuminata*), elm (*Ulmus*), birch (*Betula*), black cherry (*Prunus serotina*), and chestnut (*Castanea*) in earlier collections.

UNDER BARK. Five and three-tenths percent of the collections were from under bark, and this habitat has probably produced many of the earlier specimens which do not have habitat records. Of the 23 species eight have been found under bark, and three, *E. californicus*, and *acomanus*, and *A. cavicollis* have only been found here. The latter two have been found only under pine bark, and this may be true too of *californicus* considering its locality (Lake Tahoe).

SAWDUST. Old sawdust piles, especially those which are partially shaded, have produced 7.3 percent of the collections and 11 of the 23 species. Frequently, cut slabs or slash may be mixed with sawdust, and beetles can be found in the sawdust itself, on the surface of slabs buried in sawdust, and under the bark of slabs. Sawdust directly exposed to sun often has relatively high internal temperatures. Pselaphids in the *Euplectus* complex were found only in the cooler, shaded areas, but some genera, *Batrissodes* and *Tmesiphorus* have been found in relatively warm spots.

LOG MOLD. Well decayed log mold has produced 20.2 percent of the collections and 12 of the 23 species. Stump mold is included here.

FOREST FLOOR LITTER. This is the most varied and least understood of all microseres. Various qualities of litter are found from a mat of entire, newly fallen leaves several inches thick, to a thin barely perceptible covering over mineral soil. Designations such as duff, leaf mold, ground-cover, litter, and more exacting "*Rhododendron* duff on steep hillside" are commonly used. Forest floor litter and leaf litter combined have produced 8.4 percent of recorded collections, and 11 of the 23 species.

OLD COMPOST AND OLD MANURE. These two microseres have produced only two species, *E. karsteni* and *signatus*, and 2.2 percent and 3.6 percent respectively of recorded collections. *E. signatus* has been collected only in these habitats, although European populations of this species are reported from other habitats. The compost category includes haystacks, strawpiles, corncob piles, grass heaps, and the "compost pile" of organic gardeners. In all cases manure collections were from well-decayed and mixed material, e.g., manure mixed with straw, hay, sawdust, or wood chips. One consistently productive manure pile in a forgotten corner outside a riding stable (Cook County, Illinois) contains both of these species of *Euplectus* as well

as manure worms (*Eisenia foetida?*), dermapterans, isopods, pseudoscorpions, ptiliids, and a variety of other forms.

Only 2.6 percent of the collections were from habitats other than those already listed. *Moss*. Although frequently productive of pselaphids only two of the 23 species were found in moss: One male *E. karsteni*, and two male *L. pertenuis*. *Polypore fungus*. One record only of 1 male *P. linearis* from a rotting polypore. *Mammal nest*. One record only of three male and four female *E. confluens* from a squirrel nest on an oak branch. *Light collections*. *P. linearis* has been collected four times in a black-light trap run through an entire year at Hart Woods near Urbana, Illinois by M. W. Sanderson. One record of *P. spinifer* from Gainesville, Florida at white (?) light completes the light catch records. H. Dybas collected a male *P. sexualis* in dusk flight near Mobile, Alabama, so occasionally these beetles do fly.

ADDITIONAL PUBLISHED RECORDS. Thompson in 1924 reported *Euplectus brunneus* Grimmer from prairie sod in Aberystwyth, Wales. But this is the only record of the genus from grassland. E. A. Hicks (1960) in his book on insects occurring in birds' nests lists nine pselaphids. Six of these are *Euplectus*: *karsteni*, *nanus*, *piceus*, *punctatus*, *sanguineus*, and *signatus*, all are European records. The species of birds whose nests were most often associated with *Euplectus* are the following: *Ciconia ciconia* L., *Sternus vulgaris* L., *Turdus philomelus* Brehm, *Delichon urbica* L., *Apus apus* L., *Falco tinnunculus* L., *Dryocopus martinus* L., *Erithacus rubecula melophilus* Hart.

BEHAVIOR

Observations were made in the laboratory of living *Euplectus confluens* in plaster of paris chambers with glass covers. The beetles seemed to actively explore the chamber and investigate all cracks and pits. If the glass cover was removed even for a few seconds, the beetles would escape. Some individuals tried to burrow between the plaster and the glass apparently attempting to escape. During brief observations when the beetles had been in the dark, or at cool temperatures below 18°C, they were usually quiet.

The rate of locomotion for *E. confluens* is about 2 mm per second on an even surface (in a near saturated atmosphere; 50 foot candles illumination; 24°C). A positive thigmotaxis was often shown. If a bit of paper or wood was placed with the beetles they would usually take a position between the object and the floor of the chamber even in the dark. The beetles tended to aggregate on objects placed in the chamber, but when in a bare chamber they remained solitary. When at rest beetles showed equal preference for horizontal, vertical, or

inverted positions, hanging upside down from the glass cover or a piece of paper.

A beetle isolated in a microchamber with a pitted floor moved with its antennae horizontal and at a 45° angle from the body axis. When a pit was encountered an antenna would dip into it as if exploring its contents. This might be done without the beetle breaking stride if the pit were small. When a large pit was encountered the antenna was introduced first and then the head followed. After a second, the beetle backed out and continued on. When walking, the beetles hold the antenna out, as mentioned; often the club will tap the surface much the same as a blind man using a cane.

Cleaning actions of a female *E. confluens* were thus: Antenna—an antenna was bent down and the proleg reached up to grasp it. It was then moved to the mouthparts and drawn through the maxillae. Dorsum—this was cleaned by the metalegs, one or the other being swung over the back and drawn posteriorly in a combing motion. The metatarsi were then cleaned by rubbing them together behind while the beetle balanced on the four front legs. The cleaning of an antenna and the combing of the dorsum was briefly carried on at the same time.

Encountering reactions of a female *E. confluens* toward another female consisted of stopping, tapping the other beetle with the antenna, and then moving on. When food animals were encountered the beetle would hesitate, and then lunge forward grabbing the prey, e.g., a mite, with its mandibles. The prolegs might be braced against the integument of the prey to add leverage. Usually large mites and other beetles were simply ignored. A large male pseudoscorpion, *Mirochernes dentatus* (Banks), was kept in a chamber with three *E. confluens* for several days. I believed that the *Mirochernes* might attack the pselaphids, but instead a mutual avoidance was established. Only once when the pseudoscorpion was excited, he grabbed a beetle by the head with a chela but immediately let it go without damaging it.

In humid chambers at 24°C , *E. confluens* was unreactive to diffuse light of 50 foot candles. If offered a choice of light or dark halves, either was randomly selected. Only under the higher intensities of a microscope spotlight did the beetles select the dark half of the chamber, but still they made short ventures into the lighted half.

DISTRIBUTION

Euplectus, *Pycnoplectus*, and *Leptoplectus* are well represented in the Eastern United States. *Acolonia* is known from only two collections, one in Northeastern and one in central Western Florida. Although some species are associated with conifer forests and others

with manure or compost, the majority are found within the Eastern Deciduous Forest Biome and its ecological equivalents. Forests of the Mississippi Valley, from coastal Alabama north through the Appalachian Mountains, and forests of the Great Lakes region, have produced the most abundant collections.

Leptoplectus ranges from Maine to the Mississippi River and south to Florida. *Pycnoplectus* shares most of this range, but some species such as *falcatus*, *difficilis*, and *infossus* are restricted to the Appalachians; *linearis*, *interruptus*, and *spinifer* in comparison, have scattered distributions.

The *confluens* group of *Euplectus* is widely found east of the Mississippi River, but does not occur abundantly in the South. *E. confluens*, the most abundant eastern species with 144 collection records, has two disjunct records, one from Arkansas and the other from Idaho! Efforts to find populations which would indicate a continuous range for this species have been unsuccessful. Two species in the *californicus* group of *Euplectus*, *idahoensis*, and *californicus*, are thus far endemic to their name states; *elongatus* is restricted to the East. *E. duryi* and *acomanus* show widely disjunct ranges, *duryi* frequent in eastern states is recorded from Colorado and Idaho, *acomanus* from New Mexico to Indiana, to Maryland.

Remarkably, two European *Euplectus*, *karsteni* and *signatus* were collected here. *E. karsteni* fits the characteristics and ecology of the *confluens* group, and was collected 22 times, half from tree holes, and about half from manure and compost. *E. signatus*, collected 10 times, was found only in manure and compost in the Great Lakes region and near the St. Lawrence seaway. This suggests that *signatus*, and and perhaps *karsteni* as well, have been introduced with compost or with livestock. Park (1953) reported another European pselaphid, *Trichonyx sulcicollis* (Reichenbach), from New York, which may have been introduced in nursery stock.

ABBREVIATIONS

Museums and private collections

ANSP	—Academy of Natural Sciences, Philadelphia, Pennsylvania
CASA	—California Academy of Sciences, San Francisco, California
CMNH	—Cincinnati Museum of Natural History, Charles Dury collection, Cincinnati, Ohio
FMNH	—Field Museum of Natural History, Chicago, Illinois
HS	—Harrison Steeves, Jr., collection, now at FMNH

ICCM	—Carnegie Museum, Ulke collection, Pittsburgh, Pennsylvania
INHS	—Illinois Natural History Survey, Urbana, Illinois
JAWC	—John A. Wagner collection, Evanston, Illinois
MCZC	—Museum of Comparative Zoology, LeConte and Fall collections, Cambridge, Massachusetts
OP	—Orlando Park collection, now at FMNH
OSUC	—Ohio State University, H. W. Wenzel collection, Columbus, Ohio
Paris	—Museum National d'Histoire Naturelle, Raffray collection, Paris, France
USNM	—United States National Museum, Casey collection, Washington, D.C.

Used in habitat records

TH	—tree hole
TCH	—tree crotch hole

Used in literature citations

cat. citation	—catalog citation
descrip. note	—descriptive note
descript.	—description (full)
distr. data	—distribution data
distr. rec.(s)	—distribution record(s)
ecol.	—note on ecology
key ref.	—placement in a key

Used in figure captions

SEM	—Scanning Electron Microscope
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